

ADDENDUM TO THE DRAFT ECONOMIC IMPACT ANALYSIS OF PROPOSED CRITICAL HABITAT FOR THE MAUI AND KAHO‘OLAWÉ PLANTS

1. INTRODUCTION

In April 2002, the U.S. Fish and Wildlife Service (the Service) proposed designation of critical habitat under the Endangered Species Act of 1973, as amended (the Act) for the Maui and Kaho‘olawe Plants (the Plants). This proposal encompassed approximately 145,514 acres of land on the islands of Maui and Kaho‘olawe in Hawai‘i. Because the Act requires an economic analysis of the critical habitat designation, the Service released a “Draft Economic Impact Analysis of Proposed Critical Habitat for Threatened and Endangered Plants on Maui” (hereafter the DEA) for public review and comment in October 2002.¹

The primary purpose of this Addendum is to update the DEA. As such, the Addendum revisits the assumptions and analytic conclusions presented in the DEA in light of new information obtained since the DEA was published. It also addresses issues raised in public comments on the DEA.

2. EXCLUDED AND REDUCED UNITS

As a result of new information and for reasons other than economic impacts, the Service intends to remove five units (Units B2, C1, C2, G4 and M from Maui) and modify 17 units (Units A, B1, C3, C4, D1, E, G1, G3, G5, H, I1, I3, I4, J, K and L from Maui and Unit A from Kaho‘olawe) from the proposed designation. With the intended modifications, the total acreage would be reduced from 145,514 acres to 105,739 acres, or a decrease of 39,776 acres (27 percent). Table Add-1 presents the proposed rule acreage, the acreage as intended to be modified, and the change between the two for each of the critical habitat units.²

The preamble to the final rule explains the Service’s revisions to the proposed critical habitat designation. Henceforth, the term “intended designation” refers to the designation with the above intended modifications.

¹ Copies of the *Draft Economic Impact Analysis of Proposed Critical Habitat for Threatened and Endangered Plants on Maui* are available from the Pacific Islands Fish and Wildlife Office, U.S. Fish and Wildlife Service, Honolulu, Hawai‘i.

² The Service has indicated that it intends to remap the boundaries in the final rule for the critical habitat to exclude these areas (Memorandum to Chief, Branch of Listing, December 12, 2002).

Table Add-1: Maui & Kaho'olawe Plants Revised Critical Habitat Acreage

Item	DEA Acres	Addendum Acres	Change
MAUI			
Total Acreage	126,531	102,823	23,708
Unit Acreage			
A	9,598	4,033	5,565
B1	10,808	4,349	6,459
B2	893	-	893
C1	56	-	56
C2	24	-	24
C3	400	175	225
C4	400	95	305
D1	17,175	15,186	1,989
D2	523	523	0
E	3,432	1,386	2,046
F	357	357	0
G1	10	9	1
G2	2	2	0
G3	16	15	1
G4	53	-	53
G5	77	75	2
G6	27	27	0
H	34,843	31,319	3,524
I1	4,601	4,511	90
I2	1,680	1,680	0
I3	1,117	1,116	1
I4	1,227	1,226	1
J	14,308	14,295	13
K	13,502	13,487	15
L	11,396	8,956	2,440
M	6	-	6
Land Ownership*			
Federal	21,784	21,757	27
State/County	59,285	49,544	9,741
Private Owners	47,225	31,521	15,704
State Land Use Districts*			
Conservation	99,152	81,151	18,001
Agricultural	29,175	21,672	7,503
Urban	-	-	-
KAHO'OLAWA			
Total Acreage	18,984	2,915	16,069
Land Ownership*			
Federal	-	-	-
State/County	18,984	2,915	16,069
Private Owners	-	-	-
State Land Use Districts*			
Conservation	18,984	2,915	16,069
Agricultural	-	-	-
Urban	-	-	-

* Land ownership and State land use district acreage totals may not equal total acres due to digital mapping discrepancies between TMK data and USGS coastline or due to rounding.

3. METHODOLOGY

The analysis in the DEA incorporated two baselines: one which addressed the impact of critical habitat designation that may be ‘attributable coextensively’ to the listing of the species and one which addressed the incremental impact of the critical habitat designation itself.

This Addendum utilizes one baseline and analyzes the impacts of critical habitat designation that may be attributable coextensively to the listing of the species. Because of the potential uncertainty about the benefits and economic costs resulting solely from critical habitat designations, the Service believes that it is reasonable to estimate the effects of the designation utilizing this approach to avoid understating potential economic impacts. It is important to note that the inclusion of impacts attributable coextensively to the listing does not convert the economic analysis into a tool to be considered in the context of a listing decision.

4. DIRECT COSTS

As noted above, the Service indicates that it intends to modify the critical habitat designation by removing five units and reducing 17 units for reasons other than economic impacts. These changes would affect some of the direct costs estimated in the DEA. As such, this section revisits the costs affected and derives new costs according to the intended modifications. The DEA costs, the revised Addendum costs, and an explanation for the changes are presented in Table Add-2 at the end of the Addendum.

4.a. Management of Game Hunting

Chapter VI, Section 3.a. of the DEA presented estimates of future consultation and project modification costs associated with game-management projects. The DEA’s estimate of section 7-related project modification costs for game-management projects on Maui was based on an assumption that past project modification costs were limited to areas considered *occupied*. Therefore, the DEA multiplied its estimate of project modification costs in the State hunting units by a multiplier that reflected how much larger the total critical habitat is than the *occupied* habitat. However, public comment questioned the estimate for project modifications costs, noting that past project modifications were not limited to areas considered *occupied* by the Plants since ungulates roam throughout an area. The Addendum revisits this part of the analysis to address this comment and to reflect the conclusion that the project modification costs do not need to be projected out to add *unoccupied* habitat, because it is already included.

Anticipated Project Modification Cost:

C Total Section 7 Costs: \$23,100 to \$37,000

The DEA made the assumption that the cost of past project modifications only incorporated the portions of the hunting units that overlap with the *occupied* proposed critical habitat. This assumption was questioned during public comment on the basis that prior project modifications covered areas considered *unoccupied* by the Plants in recognition of the mobility of ungulates. Specifically, public comment noted that the prior consultation already modified the State’s proposed game mammal program to address potential impacts to the habitat everywhere on the island, including *occupied* and *unoccupied* habitat and areas inside and outside of critical habitat designation, based on the understanding that increasing game mammal populations in one location

where the Plants are not present may cause those mammals to move to areas where the Plants are present and cause destruction.

Upon further review of past consultations and past project modifications, the estimate for project modification costs has been revised to reflect that project modification costs are unlikely to increase as a result of critical habitat designation. Past project modifications were proposed without regard to whether an activity was within an *occupied* or *unoccupied* area. It is anticipated that future project modification costs will remain similar to 2001 costs (\$110,000). Over a ten-year period, these costs on Maui would be between \$23,100 and \$37,000 [$(\$110,000 \times 2 \text{ (estimated number of consultations over the next ten years)} \times 10.5\% \text{ (percentage of State hunting land on Maui)})$ and $\$110,000 \times 2 \text{ (estimated number of consultations over the next ten years)} \times 1/6 \text{ (based on equal allocation of funding to the six main islands)}]$.

4.b. Department of Hawaiian Home Lands – Kahikinui Development

Chapter VI, Section 3.d.(1) of the DEA presented estimates of costs relating to planned activities as part of the Kahikinui Kuleana Homesteads. However, the Service indicates that it intends to modify Unit H to exclude the Kahikinui Kuleana Homestead project area for biological reasons. Because all homestead development and many of the potential community-based economic development activities would take place in this area, section 7 costs related to these activities that are presented in the DEA would no longer be expected.

At the same time, approximately 16,450 acres owned by the Department of Hawaiian Home Lands (DHHL) would remain within the critical habitat designation. As noted in the DEA, it is expected that the community at Kahikinui will participate in the management and care for the DHHL land outside the immediate homestead area. For example, the DEA noted that a plan to protect and restore the native forest and watershed on the *mauka* slopes and a community-based economic development and *makai* management plan have been completed. These plans may be implemented through efforts of beneficiary community-based non-profit organizations who may seek Federal funding to support their efforts. Section 7 costs associated with these activities would still be expected.

Thus, the Addendum revises this section of the DEA and adjusts the costs accordingly.

Consultation Cost:

C Total Section 7 Costs: \$0 to \$47,100

The above estimate is based on (1) zero to three consultations in the next ten years, (2) the Medium cost (from Table VI-I of the DEA) of a consultation with a Federal agency as the applicant and with the involvement of a non-Federal applicant, and (3) no biological survey.

The revised number of consultations is based upon the initial estimate contained in the DEA of between one to five consultations over the next ten years, the intended critical habitat designation, the number of activities that could occur within the intended critical habitat designation, the small size of the existing community at Kahikinui, the unique constraints on the community's resources, and the number of past activities. The range provided is believed to be a reasonable estimate of the number of section 7 consultations over the next ten years.

As in the DEA, a Medium cost is conservatively attributed to the consultations because of uncertainty about what a particular project may involve and where it may be located. No biological surveys are anticipated because of the significant amount of existing biological information regarding Kahikinui.

4.c. Department of Hawaiian Home Lands – Pu‘u o Kali Development

Chapter VI, Section 3.d.(3) of the DEA discussed activities on 2,051 acres of land managed by DHHL in Unit E. The DEA concluded that no consultations were anticipated because there were no known activities with *Federal nexus* on the DHHL land in Unit E. Public comment from DHHL objected to the designation of critical habitat on this land, raising concerns about impacts to Native Hawaiian beneficiaries who already lease and/or who may lease the land in the future and who may participate in Federal loan and mortgage guarantee programs. However, as noted earlier, the Service indicates that it intends to modify Unit E to remove the DHHL lands from the designation for biological reasons. Therefore, no section 7-related costs attributable to critical habitat would result from any future activities in this area.

4.d. Kaho‘olawe

Chapter VI, Section 3.e. of the DEA presented estimates of costs associated with consultation relating to restoration activities on Kaho‘olawe. As noted earlier, the Service indicates that it intends to reduce the designation on Kaho‘olawe from 18,984 acres to 2,915 acres for biological reasons. Based on the intended reduction in acreage, a reduced number of section 7 consultations would be expected over the next ten years. Thus, the Addendum revises this section of the DEA and adjusts the costs accordingly.

Consultation Cost:

C Total Section 7 Costs: \$0 to \$47,100

The above estimate of consultation costs is based on (1) zero to three consultations in the next ten years, (2) Low to Medium cost (from Table VI-I of the DEA) of a consultation with a Federal agency as the applicant and with the involvement of a non-Federal applicant, and (3) no biological survey.

The revised number of consultations is based upon the initial estimate contained in the DEA of between two and five consultations over the next ten years, the intended reduction to the critical habitat designation, and the potential for activity within the intended critical habitat designation over the next ten years. As modified, the intended designation would cover the southeastern coastline, an area along the eastern side of the island, and an area on the western side of the island and would predominantly overlap with Level 3 and Level 4 areas – areas which have either received surface clearance only or received no ordnance clearance. Anticipated activities in these areas within the next ten years are likely to be limited to ordnance removal. Part of the intended designation on the western tip of Kaho‘olawe is a Level 1 area, and anticipated activities in this area could include operation of overnight campsites with minimal facilities to support restoration efforts. The range provided is believed to be a reasonable estimate of the number of section 7 consultations over the next ten years.

As in the DEA, a Low to Medium cost is conservatively attributed to the consultations because of uncertainty about the size and scope of a particular activity. No biological surveys are

anticipated due to the extensive amount of biological information collected during ongoing restoration efforts.

4.e. Agriculture and Ranching Operations

Chapter VI, Section 3.g. of the DEA discussed activities on Agricultural land and specifically recognized that some of the State managed Agricultural land is leased out to private entities as pasturage. During public comment, the Land Division within the State Department of Land and Natural Resources (DLNR) identified three parcels within the proposed critical habitat designation that are leased for pasture purposes. DLNR-Land Division expressed concern that designation of these parcels could result in restrictions on their ability to continue to lease these lands, resulting in loss of lease revenues and other benefits. However, no direct section 7 costs involving these leases are anticipated because there is no known *Federal involvement*. DLNR-Land Division's concerns about the indirect impacts are addressed in Section 5.b. of this Addendum.

Chapter VI, Section 3.g. of the DEA also presented estimates of section 7 costs associated with participation in federally sponsored agricultural or ranching related programs, such as Farm Bill programs administered by the Natural Resources Conservation Service (NRCS). The DEA based its estimate of two to eight consultations over the next ten years on the amount of Agricultural land contained within the proposed designation, the number of past projects located within the area proposed for designation, and the possibility that some landowners could decide not to participate in future programs to avoid *Federal involvement* in their activities.

The Service indicates that it intends to reduce the amount of Agricultural land designated from 29,175 acres to 21,670 acres, a reduction of 25 percent. As a result, the intended designation would contain approximately 10,980 acres of Agricultural land owned by those most likely to participate in NRCS programs: private landowners. However, the majority of this land, approximately 9,028 acres, is owned by two landowners who indicated during public comment that they will not participate in future NRCS programs if their land was designated as critical habitat. Moreover, as noted in the DEA, not all of the Agricultural land intended for designation is in active agricultural use. For example, the Kanaio Natural Area Reserve (937 acres) would remain within the intended critical habitat designation. Finally, as noted in the DEA, competition for NRCS funding is strong.

Based upon the intended modifications and the new information, the DEA overstated the number of consultations reasonably expected to occur over the next ten years. Thus, the Addendum revises this section of the DEA and adjusts the costs accordingly.

Consultation Cost:

C Total Section 7 Costs: \$0 to \$41,200

The above estimate of consultation costs is based on (1) zero to two consultations in the next ten years, (2) Medium cost (from Table VI-I of the DEA) of a consultation with a Federal agency as the applicant and/or with the involvement of a non-Federal applicant, and (3) if needed, a biological survey of a 100-acre open site with easy to medium access. As noted in the DEA, although all past biological assessments in Hawai'i have been done by NRCS staff, a project or activity involving a large area could require the farmer or rancher to engage the services of a biologist. Thus, as in the DEA, the low estimate does not include the costs of a biological survey,

while the high estimate assumes that each of the projects would require a biological survey of a 100-acre open site with medium access.

The revised estimated number of consultations over the next ten years is based upon professional judgment, taking into consideration:

- the reduction in the amount of Agricultural land and specifically, in the amount of privately owned Agricultural land intended for designation;
- the number of private landowners owning Agricultural land intended for designation and the size of their holdings;
- the statements by two large landowners of their intent to not participate in NRCS programs should critical habitat designation of their land occur;
- the location of the Agricultural land intended for designation; and
- current and planned use of the Agricultural land intended for designation.

Anticipated Project Modification and Costs:

C Total Section 7 Costs: \$0 to \$100,000

As indicated in the DEA, because projects sponsored by the NRCS programs under the Farm Bill are generally beneficial in nature, it is unlikely that land management practices instituted with funding from these programs will adversely affect the listed plant species. However, the Service may recommend changes, such as the relocation of the planned project or activity to an area that does not affect critical habitat. A landowner could decide to forego the Federal funding and cancel the contract with NRCS rather than make modifications identified through the section 7 consultation process with the Service. As noted in the DEA, \$50,000 is the worst-case scenario of the costs of project modification for Farm Bill projects because funding limitations under NRCS historically have been less than \$50,000. Thus, the total project modifications cost is estimated at \$0 to \$100,000 (2 x \$50,000).

4.f. Electric Generation and Delivery – Kaheawa Pastures 20 MW Windfarm

Chapter VI, Section 3.h of the DEA presented estimates of section 7 costs associated with planned construction of a 20 MW windfarm within the State Conservation District in an area known as Kaheawa Pastures. Since publication of the DEA, the original developer of the windfarm, Zond Pacific (a subsidiary of Enron Wind Corporation) was sold to General Electric Wind Energy and Hawi Renewable Development Inc. (GE-Hawi) and the initial Conservation District Use permit granted to Zond Pacific expired. At the present time, two different companies, GE-Hawi and Hawaiian Wind Energy, have applied for a conservation district use to develop a windfarm at the site. The State Board of Land and Natural Resources (BLNR) will hold hearings on both permit applications in January, 2003, and eventually one company will be selected. Because both companies' proposals are similar to that initially proposed by Zond Pacific, no changes are anticipated to the section 7 costs estimated in the DEA.

4.g. Water Systems

Chapter VI, Section 3.k. of the DEA presented estimates of section 7 costs associated with water systems. The DEA concluded that between zero and two consultations would occur over the next ten years. During public comment, more specific information was received regarding planned projects by the Maui County Department of Water Supply (DWS) in Units B2 and L. Possible and planned projects include water source development in Unit B2; construction of a water reservoir adjacent to Unit L; access and intake improvement in Unit L; and repair and maintenance of existing flumes in Unit L.

As noted earlier, the Service indicates that it intends to remove Unit B2 from the final designation. Thus, no section 7 costs would be anticipated to result from future DWS projects in this area. Moreover, the additional information regarding activities in Unit L is consistent with the estimated number of consultations provided in the DEA. Most of the identified DWS projects in Unit L constitute repair and maintenance of existing man-made features and structures, and as such, would not be subject to section 7 consultation. However, to the extent that the planned improvements go beyond repair and maintenance and would be subject to section 7 consultation due to Federal funding or permitting, the DEA's estimate of zero to two consultations reasonably reflects the potential number of section 7 consultations over the next ten years. Thus, the Addendum makes no changes to the section 7 costs estimated in the DEA.

4.h. Roads

Chapter VI, Section 3.m. of the DEA discussed roads, and concluded that no section 7 costs are anticipated because no new roadway projects were planned within the proposed critical habitat over the next ten years. The State Department of Transportation (State DOT) submitted comments on the proposed rule, expressing concern that critical habitat could impact the maintenance, repair and improvements to State Highways in Units C1, C2, and C3 and seeking a minimum buffer zone between the road and critical habitat of 100 feet.

The Service indicates that it intends to remove Units C1 and C2 from the final designation and substantially reduce Unit C3 in the final designation. State DOT's comments did not identify any planned widening or other significant improvement project within Unit C3. Rather, State DOT's concerns focused on the impact to routine repair and maintenance. Operation and maintenance of existing man-made features and structures are not subject to section 7 consultation. Thus, no changes have been made to the DEA.

5. INDIRECT COSTS

As noted above, the Service indicates that it intends to modify the critical habitat designation by removing five units and reducing the acreage of 17 other units for reasons other than economic impacts. These changes would affect some of the indirect costs discussed in the DEA. As such, this section revisits the indirect costs affected. An explanation for the specific changes is presented in Table Add-2 at the end of this Addendum.

As noted in the DEA, because consultation under section 7 only applies to activities that have Federal involvement, the designation of critical habitat does not afford any additional protections for listed species with respect to strictly private activities. However, the DEA also recognized that designation of critical habitat may have indirect impacts beyond those associated with the Act. For example, potential indirect impacts raised by stakeholders include changes in game management,

imposition of conservation management obligations, redistricting of Agricultural land into the Conservation District, and reduced property values.

There is considerable uncertainty on whether any or all of these indirect impacts may occur, as they depend upon actions and decisions by entities other than the Service under circumstances for which there is limited or no history that can be used to determine the probability of different outcomes. Thus, based on the available information, these impacts were discussed qualitatively in the DEA and where possible, estimates were given of worst-case scenarios for illustrative purposes.

5.a. Indirect Impacts on Game Management

Chapter VI, Section 4.b. of the DEA analyzed indirect impacts on hunting conditioned on a change in game management. Assuming, for the sake of illustration, that the State Department of Land and Natural Resources (DLNR) builds fences to exclude game ungulates from the proposed critical habitat units within State-managed hunting units, the DEA analyzed the impacts this may have on hunting. However, the Service indicates that it plans to remove portions of the State-managed hunting units from the final critical habitat for biological reasons. This would result in a slight decrease in the acreage of critical habitat that overlaps with the hunting units from approximately 32,500 acres to approximately 30,715 acres. These overlapping areas represent about 29 percent of the total State-managed hunting units on Maui.

In addition, the DEA relied upon data from the Service's 1996 National Survey of Fishing, Hunting and Wildlife-Associated Recreation. Since the publication of the DEA, the Service's 2001 National Survey of Fishing, Hunting and Wildlife Associated Recreation has become available. The Addendum incorporates this more recent data where possible. As such, the following are the revised estimates of impacts on hunting.

Economic Activity Associated with Hunting on Maui

As discussed in the DEA, one issue surrounding the proposed critical habitat designation concerns the management of game-mammal populations (i.e., feral pigs, goats, and deer) and the potential loss of valued hunting lands. The concern does not extend to game birds, however, since the Service currently believes that these birds and the hunting of them do not have a significant adverse impact on listed species or their habitats.

Appendix VI-A, Section 3 of the DEA provided an estimate of the economic activity associated with game-mammal hunting on Maui. As noted above, since the publication of the DEA, more recent data from the Service's 2001 National Survey of Fishing, Hunting and Wildlife Associated Recreation have become available. In 2001, 17,000 hunters in Hawai'i, most of whom were local residents, spent an estimated \$15.1 million on hunting (2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation). As noted in the DEA, companies that supply goods and services to hunters, and employees of these companies, in turn purchase goods and services from other companies, thereby creating even more sales. These "indirect" sales are scattered throughout the economy and the State. When both "direct" and "indirect" sales were included, total Statewide sales due to hunting in Hawai'i amounted to about \$26.8 million in 2001. In turn, this economic activity supported an estimated 454 jobs and \$8.8 million in income (an average of \$19,000 per job). These estimates are based on multipliers from the Hawai'i Input-Output Model (DBEDT, 2002). Using this updated information, the 2001 estimated economic activity supported by just game-mammal hunting on Maui amounted to about \$2 million in direct sales, \$3.5 million in total direct and indirect sales, 60 jobs, and \$1.2 million in income. These figures are order-of-magnitude

estimates based on 70 percent of the hunting trips being spent on hunting game mammals, and 19 percent of the State's hunting activity taking place on Maui.

These estimates update those contained in Appendix VI-A of the DEA and are used below to estimate the economic activity associated with hunting on Maui and in the intended critical habitat designation.

Economic Activity Associated with Hunting in Critical Habitat

If enclosure fences were built to exclude ungulates from critical habitat, approximately 30,715 acres (i.e., 29 percent of State managed hunting units on Maui) would be eliminated from available hunting areas. If about half of those who hunt game mammals on the affected lands were to give up hunting, then hunting activity on Maui could drop by about 14.5 percent (half of 29 percent). The other half of those who hunt in the affected areas might switch to other hunting areas or to hunting game birds.

The drop in hunting activity would translate into a decrease in annual economic activity related to hunting on Maui of about \$290,000 in direct sales (14.5% of \$2 million); \$510,000 in total direct and indirect sales (14.5% of \$3.5 million); nine jobs (14.5% of 60 jobs); and \$170,000 in income (14.5% of \$1.2 million). However, the decrease in expenditures by the displaced hunters would probably be spent on other recreational activities, goods and services, so these figures are likely to overstate the economic costs.

Value of Hunting to Hunters on Maui

In addition to the change in economic activity discussed above, a reduction in hunting activity in critical habitat would also result in a loss in value or benefit to hunters (consumers' surplus). To determine the value of this loss, Appendix VI-A, Section 4 of the DEA provided estimates of the value of hunting to hunters on Maui. As noted above, since the publication of the DEA, more recent data on the total number of hunter-days has become available through the Service's 2001 National Survey of Fishing, Hunting and Wildlife Associated Recreation. Using this new information, the Statewide value of all hunting for 2001 is estimated at \$7.9 million, based on (1) the assumption that hunters value their experience at \$25 per day; and (2) they hunted a total of 316,000 hunter-days that year. Based on the number of trips spent hunting game mammals (approximately 70 percent) and the number of hunters on Maui (approximately 19 percent of the Statewide total), the value of just game hunting amounted to about \$1.05 million for Maui (\$7.9 million x 70% x 19%) in 2001. These figures on the value of game hunting should be interpreted as order-of-magnitude estimates, not precise estimates.

Value of Hunting to Hunters in Critical Habitat

Under the revised assumptions, the loss to consumers' surplus for hunters would be estimated at \$150,000 annually (14.5 percent of the current \$1.05 million in surplus value). But partially offsetting this loss to hunters would be benefits derived from recreational activities that replace game mammal hunting.

5.b. Conservation Management

Chapter VI, Section 4.c. of the DEA discussed the concern that some landowners will be required to alter the management of their lands that fall within critical habitat to assure the survival and conservation of the listed species. While there is no existing obligation to proactively manage lands to control threats, there is an undetermined probability that a State or Federal court could mandate conservation management as a result of litigation. Based upon review of the existing Federal and State law provisions and professional judgment, the DEA concluded that the likelihood of mandated conservation management is low.

Moreover, Chapter VI, Section 4.c. of the DEA noted that an attempt to require conservation management in a particular area through litigation is most likely to be based on section 9(a)(2) of the Act and the interplay of that provision with State law and prior judicial decisions, rather than on critical habitat designation. While the designation of critical habitat could identify the areas that are most likely to be subject to a future lawsuit, most of the resulting economic impact would be related to section 9, and thus would be outside the scope of the economic analysis. Because of the difficulty in determining what portion of the potential loss would be attributable solely to critical habitat designation, the DEA and this Addendum conservatively present the total costs that could result if conservation management were mandated.

In order to illustrate the potential costs if a State or Federal court did mandate conservation management, the DEA provided an estimate of the costs of conservation management based on the number of acres of critical habitat in the mountains and a management cost of \$30 to \$80 per acre per year. The Service has indicated that it intends to reduce the designation on Maui for the final rule to approximately 102,823 acres. Almost all (98 percent) of the land on Maui that would be in the designation can be considered to be in mountainous areas. Thus, an illustrative cost of conservation management for the revised designation, if mandated, ranges from \$3 million to \$8 million per year ($102,823 \times 98\% \times \30 and $102,823 \times 98\% \times \80).

Chapter VI, Section 4.c. of the DEA also discussed the concern that some landowners will be required to cease existing agricultural operations on their land. During public comment, DLNR-Land Division identified three parcels within the proposed critical habitat designation that are leased for pasture purposes. DLNR-Land Division expressed concern that designation of these parcels could result in restrictions on their ability to continue to lease these lands, resulting in loss of lease revenues. Other commenters also expressed concern that designation of their Agricultural land could interfere with existing ranching operations.

As discussed in section 4.c. of the DEA, the likelihood of future lawsuits stopping all existing agricultural activity within the designated critical habitat is considered low, based upon review of the existing Federal and State law provisions and professional judgment. In order to illustrate the impact if existing agricultural activity within the critical habitat was required to cease, the DEA provided two estimates: the first based on an estimate of the amount of grazing land proposed for designation and total cattle sales and the second based on an estimate of land rents for grazing land.

Based on the intended critical habitat designation, approximately 11,000 acres within the designation are in use for pasturage or for uses associated with ranching. This estimate includes both privately owned Agricultural land, as well as State land leased for pasture purposes. As discussed in detail in the DEA, 11,000 acres constitutes approximately five to nine percent of the grazing land on Maui. Utilizing total cattle sales from 2000 (\$3.2 million), the revised estimate of

the annual revenues derived from ranching within the intended critical habitat is \$160,000 to \$290,000 (5% x \$3.2 million and 9% x \$3.2 million). Utilizing land rents of \$10 per acre per year, an alternate estimate of the value of ranching in the intended critical habitat is approximately \$110,000 (11,000 acres x \$10 per acre per year).

Ulupalakua Ranch stated in its comment letter to the Service that while the lands proposed for critical habitat designation vary in productivity for cattle ranching, the average lost revenue return would be at least \$75 per acre per year. No explanation was given on how this value was obtained, but applying this estimate for illustration purposes to the approximately 11,000 acres within the intended designation used for pasturage or other uses associated with ranching, lost revenues could be \$825,000 per year.

Finally, Chapter VI, Section 4.c. of the DEA discussed the concern that existing water diversions will be impacted by the designation of critical habitat. During the public comment period, several commenters reiterated this concern. The DEA noted that the likelihood of changes to the existing water diversions based on critical habitat is very low for the following two reasons: 1) none of the Plants are stream-dependent for their survival and therefore would not cause a reduction in water diversion and 2) water infrastructures are considered a manmade feature and therefore its operation and maintenance are not subject to the critical habitat provisions of section 7, because these features and structures normally do not contain, and are not likely to develop, any *primary constituent elements*. The Addendum makes no changes to this conclusion.

5.c. State Redistricting of Land

Chapter VI, Section 4.e. of the DEA discussed the concern that land in the Agricultural District in critical habitat will be redistricted into the Conservation District.

The DEA focused on potential impacts of redistricting on the privately owned Agricultural land and estimated that approximately 13,300 privately owned acres could be affected. As noted earlier, the Service indicates that it intends to reduce the final designation. As modified, the intended designation would include approximately 10,980 acres of privately owned Agricultural land in Units A (54 acres), C4 (0.4 acres), D1 (0.5 acres), D2 (227 acres), E (1,386 acres), H (6,832 acres), I1 (0.8 acres), I2 (1,243 acres), I3 (419 acres), I4 (779 acres), and L (40 acres). The Service indicates that the Agricultural lands intended to be excluded do not contain the primary constituent elements and/or have a lower proportion of associated native species relative to other critical habitat areas. Where there exists a lower proportion of associated native species, at least eight other locations with adequate and more appropriate habitat have been identified to meet the recovery goal of eight to ten populations throughout their historical ranges on Maui, Kaho‘olawe and other islands.

Two private landowners, Ulupalakua Ranch and Haleakala Ranch, own the majority (9,028 acres or 82 percent) of these 10,980 acres. The remaining 1,952 acres are owned by 18 different landowners, with one-third of these landowners owning less than one acre of Agricultural land within the intended designation.

Based upon several factors, including discussions with the State Office of Planning, the DEA concluded that redistricting is likely to occur in only a limited number of cases, if any. For illustration purposes, assuming that 1) reduction in values could range from \$1,000 per acre for remote agricultural land to \$40,000 to \$210,000 per acre for land suitable for large-lot residential development, 2) redistricting of all the privately owned Agricultural land were to occur, and 3) only 20 percent of the privately owned Agricultural land was suitable for future large-lot residential

development, the DEA estimated the potential total gross reduction in value at \$117 million to \$569 million.

The designation, if modified as the Service indicates, would reduce the amount of privately owned Agricultural land and, specifically, areas in West Maui considered most suitable for future large-lot residential development based on the availability of water and the nature of the surrounding development. These units are intended to be removed for biological reasons. The remaining privately owned Agricultural land is not considered as suitable for future residential development due to its remote location, the nature of the terrain or the limited access to water. No specific plans for development are known. Therefore, utilizing values from the lower end of the range (\$1,000 to \$10,000 per acre), an estimate of the total drop in property value would be \$11 million to \$110 million (10,980 x \$1,000 and 10,980 x \$10,000) if all privately owned Agricultural land included in the intended designation were redistricted to the Conservation District.

During public comment, several landowners expressed concern that existing agricultural activities on private land proposed for critical habitat designation could be affected, especially if redistricting into the Protective Subzone were to occur. The designation, if modified as the Service indicates, retains a significant amount of land under active agricultural use, primarily the acreage owned by Haleakala Ranch and Ulupalakua Ranch (who own, as noted above, approximately 82 percent of the privately owned Agricultural land within the intended designation).

Much of the Agricultural land intended for critical habitat designation on Maui has been grazed for more than one hundred years. Since these historically grazed areas are highly degraded from their natural state, they are not anticipated to meet the standards of a natural ecosystem required for placement in the Protective Subzone of the Conservation District (HAR §13-5-11). Grazing is allowed in any other subzone of the Conservation District with Board of Land and Natural Resources (BLNR) approval. However, existing uses would be grandfathered, so additional costs associated with obtaining BLNR approvals and loss in property values are not anticipated.

The DEA also estimated that affected landowners could spend approximately \$50,000 contesting redistricting. The modification of the proposed critical habitat has reduced the number of private landowners significantly affected. While up to 20 landowners are potentially affected by redistricting, six of the 20 affected landowners own less than one acre of Agricultural land in the intended designation and another seven of the 20 affected landowners own fewer than 50 acres of Agricultural land in the intended designation. Contesting redistricting could be expected to involve seven to 14 landowners. As noted in the DEA, the estimated cost of contesting redistricting is approximately \$50,000. Thus, total costs of contesting redistricting could range between \$350,000 and \$700,000 (\$50,000 x 7 and \$50,000 x 14).

5.d. Reduced Property Values

Chapter VI, Section 4.g. of the DEA indicated that uncertainties about the impacts of the proposed critical habitat designation can cause a temporary reduction in land value that will continue until clear and correct information is distributed. These concerns involve lands in the Agricultural District. The DEA noted that the worst-case scenario – and one that is not expected over the long term because uncertainties about the implications of the designation are likely to dissipate over time – would be a perception among potential buyers that the land should be valued as if it were subject to the same restrictions as land in the Conservation District. As noted above in section 5.c., if all privately owned Agricultural land within the intended designation were redistricted to the

Conservation District, the total drop in property value could be \$11 million to \$110 million (11,000 acres x \$1,000 and 11,000 acres x \$10,000).

5.e. Costs to Investigate Implications of Critical Habitat

Chapter VI, Section 4.i. of the DEA indicated that landowners may want to learn how the designation may affect (1) the use of their land (either through restrictions or new obligations), and (2) the value of their land. Public comment noted that the estimate of investigative costs presented in the DEA was too low considering the size of the designation and uncertainties about the exclusion of “unmapped holes.” However, since the commenter did not provide an alternative estimate of time or cost incurred in order to investigate implications of critical habitat this Addendum does not revise the number of hours that the DEA estimated the landowner and/or his attorneys or professional staff would spend on investigating the issues. However, the Addendum does revise the number of affected landowners to 26 because of the intended modifications to the critical habitat indicated by the Service. Thus, the Addendum revisits this section as follows:

C Total Section 7 Costs: \$31,800 to \$247,000

This cost is based on the following assumptions: (1) 12 to 26 landowners will investigate the implications of critical habitat; (2) the landowner and/or his attorneys or professional staff will spend about 15 to 40 hours on the investigation at rates of \$150 to \$200 per hour; and (3) Service staff will spend four to ten hours at \$100 to \$150 per hour responding to inquiries from these landowners. The range reflects the possibility that landowners with fewer than 50 acres within the intended critical habitat designation might not investigate.

Public comment questioned whether the indirect cost of investigating the implications of critical habitat should be considered a sunk cost of the critical habitat designation process rather than a potential future cost of a final designation. While some landowners may expend time and money to investigate the implications of critical habitat on their land during the designation process, many landowners may not do so until after final designation is complete. Thus, the DEA and this Addendum conservatively treat these costs as a cost attributable to final designation.

5.f. Reduced Cooperation on Conservation Projects

Chapter VI, Section 4.j. of the DEA indicated that landowners may cease participation in federally funded conservation projects to avoid *Federal involvement* in their land management practices, out of concern that participation in conservation projects within critical habitat may result in project modifications that expand the project and increase the cost or that shift the focus of the project away from the landowner’s initial intent. The DEA anticipated that any change from the current level of cooperation from landowners would depend upon how much land is designated, which land is designated, actual and perceived restrictions on land use, and perceived risks in the future. At the time the DEA was drafted, the amount of reduction in cooperation was undetermined.

During the public comment period, the Service received letters from two landowners, Ulupalakua Ranch and Haleakala Ranch, stating that they will no longer participate in conservation projects designed to assist native plant species if critical habitat is designated on their lands. Over the past three years alone, these two landowners have participated in more than seven different conservation projects, receiving more than \$290,000 from the Service and NRCS. This funding is often, but not always, matched by the landowner, and thus the maximum cost of these projects is approximately \$580,000. While the benefits of these projects are difficult to quantify (as discussed

further in Section 6 below), the biological value of these projects to the native plants is at minimum equal to the cost of each project. Assuming that participation over the past three years is indicative of the average level of participation, over a period of ten years, the value of the conservation projects would exceed \$1.7 million. Thus, a reduction in cooperation in conservation projects by these two landowners could be expected to result in a corresponding environmental loss to society of more than \$1.7 million. In addition, these landowners have indicated that they will not allow outside individuals, agencies or organizations to monitor, investigate, or collect data about native plants on their lands. In qualitative terms, the total loss to society as a result of reduced cooperation in conservation projects could be considered significant.

The DEA concluded that a modest but undetermined reduction in cooperation could occur. Based on public comments, this Addendum concludes that a significant reduction in cooperation in conservation projects would occur if Haleakala Ranch and Ulupalakua Ranch lands are designated.

6. SECTION 7-RELATED BENEFITS

6.a. Regional Economic Activity Generated by Conservation Management

Chapter VI, Section 6 of the DEA discussed the potential direct and indirect benefits that could result from critical habitat. Specifically, Chapter VI, Section 6.b.(1) discussed the economic activity generated by conservation management. As noted above, if mandated by a court order, the annual conservation management costs for the intended critical habitat would range from \$3 million to \$8 million. These expenditures would generate \$6.3 million to \$16.8 million in direct and indirect sales in Hawai'i, and would support about 105 to 280 jobs in Hawai'i. However, the economic activity supported by these expenditures on conservation management may or may not represent an expansion of Hawai'i's economy, depending upon how the expenditures are financed (e.g., by new Federal funding sources, of by State funds intended for another purpose). Chapter VI, Section 6.b.(1) of the DEA provided further explanation of this issue.

6.b. Social Welfare Benefits

There is little disagreement in the published economic literature that real social welfare benefits can result from the conservation and recovery of endangered and threatened species (Bishop (1978, 1980), Brookshire and Eubanks (1983), Boyle and Bishop (1986), Hageman (1985), Samples et al. (1986), Stoll and Johnson (1984)). Such benefits have also been ascribed to preservation of open space and biodiversity (see examples in Pearce and Moran (1994) and Fausold and Lilieholm (1999)), both of which are associated with species conservation. Likewise, a regional economy can benefit from the preservation of healthy populations of endangered and threatened species, and the habitat on which these species depend.

It is not feasible, however, to fully describe and accurately quantify these benefits in the specific context of the proposed critical habitat for the Plants, because 1) no quantified data on the value of the Maui and Kaho'olawe species exists; and 2) the Service is unable to provide specific data on the change in the quality of the ecosystem and the species as a result of the designation (for example, how many fewer ungulates will roam into the critical habitat, how many fewer invasive plants will be introduced as a result, and therefore how many more of the Plants will be present in the area). The discussion presented in the DEA and in this Addendum provides examples of potential benefits, which derive primarily from the listing of the species, based on information obtained in the course of developing the economic analysis. It is not intended to provide a complete analysis of the benefits that could result from section 7 of the Act in general, or of critical habitat

designation in particular. In short, the Service believes that the benefits of critical habitat designation are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking.

6.c. Benefits Associated with Endangered Species Preservation and Improvements to Ecosystem

A commenter suggested that the critical habitat designation for the Plants will help protect intact native ecosystems, including native forest in the watershed. In turn, the commenter suggested that this protection will promote groundwater recharge, keep water pure and clean and reduce erosion onto the reefs. The commenter also suggested that species preservation results in social welfare benefit, including cultural benefits, and that these benefits should be quantified. Chapter VI, Section 6 of the DEA already discussed these potential benefits. However, the DEA also indicated that these benefits are not quantified due to lack of information available on (1) quantified data on the value of the Maui and Kaho‘olawe species; and (2) quantified data on the change in the quality of the ecosystem and the species as a result of the designation.

When primary research is not possible, economists frequently rely on the method of benefits transfer. Benefits transfer involves application of results of existing valuation studies to a new policy question.³ Two core principles of defensible benefits transfer are (1) the use of studies that apply acceptable techniques to generate welfare values, and (2) similarity between the good being valued in the literature and the good being valued in the policy context to which the transfer is being made (i.e., the protection afforded the Plants by critical habitat). As noted above, no known studies exist on quantified data on the value of the Plants or the change in the quality of the ecosystem and the species as a result of the designation. Therefore, applying results of existing valuation studies on non-plants to the Maui and Kaho‘olawe Plants is not feasible.

6.d. UH Study on the Value of Environmental Services Provided by the Ko‘olau Mountains

A commenter suggested that a 1999 analysis by the University of Hawai‘i (UH) economists on the total value of environmental service provided by O‘ahu’s Ko‘olau Mountains be used as a model for estimating the value of the environmental benefits provided by critical habitat (Kaiser, et al). This document was, in fact, used in the DEA as a resource document for concepts, and for identifying documents that report the original research on certain subjects.

However, the UH study has limited applicability for valuing the benefits of the proposed critical habitat designation for the Plants for a number of reasons. First, the UH study had a different purpose, which was to estimate the total value of environmental benefits provided by the entire Ko‘olau Mountains on the island of O‘ahu versus the value of the more limited benefits provided by the proposed critical habitat for the Plants on the islands of Maui and Kaho‘olawe. Consistent with its purpose, the UH study provides no estimates of the changes in environmental conditions resulting from changes in land and stream management due to critical habitat designation.

Furthermore, many of the assumptions and much of the analysis in the UH study are not transferable to the economic analysis for the Plants critical habitat. For example, the value of water recharge in the UH study reflects projected water supply and demand conditions on O‘ahu – an

³ For more discussion of benefits transfer, see Environmental Protection Agency, *Guidelines for Preparing Economic Analyses* (EPA 240-R-00-003), September 2000.

island 3/4 of the size of Maui but with a population of nearly ten times that of Maui. Also, the UH benefit analysis of reducing soil runoff is unique to three valleys that drain through partially channelized streams in urban areas into the man-made Ala Wai Canal. Since this canal was designed with inadequate flushing from stream or ocean currents, it functions as an unintended settling basin so must be dredged periodically. In addition, the recreational and ecotourism values provided in the UH study apply to areas that are accessible to most hikers, which is not the case with most of the Plants critical habitat. Most of the Plants critical habitat units are in mountainous range with steep slopes and difficult access and on coastal cliffs.

7. PUBLIC COMMENTS

Some reviewers commented that the DEA did not address or did not adequately consider a variety of costs and benefits that they believe could occur due to the implementation of section 7 for the Plants. Many of these possible costs were, in fact, considered and some were addressed in the DEA. In many cases, however, potential costs were purposely not addressed in the DEA because they are not expected to occur. In other cases, it is possible for them to occur. In still other cases, the concerns no longer have substance given the Service's modifications to the proposed critical habitat. Finally, in some cases, the comments provided new information and costs were modified above in Section 4 of this Addendum.

To clarify further, the following addresses specific comments raised during the public comment period that relate to economic impact of the proposed designation but are not expected to occur and/or have already been addressed by the DEA or this Addendum.

7.a. Comment (Reduced Cooperation)

One commenter stated the proposal fails to properly consider the importance of cooperation and goodwill between the Service and private landowners, and the impact critical habitat designations will have in discouraging voluntary partnerships on private lands. Haleakala Ranch stated that if critical habitat were designated on ranch lands, the ranch would cease participation in conservation projects designed to promote endangered species recovery. The ranch also stated that the access to Haleakala Ranch land will be denied to those seeking data about the presence of the listed species, and future partnerships, existing agreements, and a land steward position may be terminated in an effort to insulate the company from outside governmental oversight. The Ranch prefers to work cooperatively with the Service and other conservation entities to continue its legacy of land stewardship. Ulupalakua Ranch stated that designation of critical habitat would result in discontinuation of its associations with organizations associated with native plant restoration. Ulupalakua Ranch will also deny access to those interested in plant conservation and would not allow reintroduction of any native plants to its private property by human activity. Similarly, Alexander and Baldwin, Inc. cautioned the Service to carefully consider the benefits of existing cooperative agreements such as the East Maui Watershed Partnership and the potential chilling that designation might have on such agreements. The Estate of James Campbell also stated a preference for encouraging the establishment of voluntary partnerships with landowners to effectuate the desired species conservation. The commenter further stated that the regulatory approach discourages the cooperation which has been a key to successful species conservation. Another commenter stated that if the Service truly wants to carry out its mission statement and "work with others to conserve, protect and enhance fish, wildlife and plants, and their habitats for the continuing benefit of the American people, they should meet with the community of the DHHL Kahikinui homesteads to explain in clear and concise terms what is being proposed and exactly how it may impact our community." Others expressed similar concerns that cooperation on the ground management was more important than critical habitat designation.

Response: Chapter VI, Section 4.j. of the DEA discussed the potential for reduced cooperation with the Service on conservation projects as a result of critical habitat. The DEA determined that a modest but undetermined reduction in cooperation may occur, along with a corresponding but undetermined environmental loss to society. However, as the comment indicates, the Service received letters from two landowners, Ulupalakua Ranch and Haleakala Ranch, during the public comment period stating that they will no longer participate in conservation projects designed to assist native plant species if critical habitat is designated. Over the past three years alone, these landowners have participated in more than seven different conservation projects, receiving more than \$290,000 from the Service or NRCS. This funding is often, but not always, matched by the landowner, and thus the maximum cost of these projects is approximately \$580,000. While the benefits of these projects are difficult to quantify (as discussed further in Section 6 above), the biological value of these projects to the native plants is at minimum equal to the costs of each project. Assuming that participation over the past three years is indicative of the average level of participation, over a period of ten years, the value of the conservation projects would exceed \$1.7 million. Thus, a reduction in cooperation in conservation projects by these two landowners could be expected to result in a corresponding environmental loss to society of more than \$1.7 million. In addition, these landowners have indicated that they will not allow outside individuals, agencies or organizations to monitor, investigate, or collect data about native plants on their lands. In qualitative terms, the total loss to society as a result of reduced cooperation in conservation projects could be considered significant.

7.b. Comment (Economic Zoning Hawai'i Land Use Law)

Two commenters stated the following: The DEA failed to consider economic impacts of critical habitat that result through interaction with Hawai'i Land Use Law. Critical habitat could result in changes to zoning under State law. There is an overriding directive under State law that endangered plant species are to be protected in the State's planning and zoning process. HRS §205-2(e) states that Conservation Districts shall include areas necessary for conserving endangered species. HRS 195D-5.1 states that DLNR shall initiate amendments in order to include the habitat of rare species. Even if DLNR does not act, the Land Use Commission may initiate such changes, or they may be forced by citizen lawsuits. Areas for endangered species are placed in the protected subzone with the most severe restrictions. While existing uses can be grandfathered, downzoning will prevent landowners from being able to shift uses in the future, will reduce market value, increase property tax, and make the land unmortgageable. Although the Service acknowledges that there could be substantial indirect costs relating to redistricting of land to the Conservation District, several commentators disagreed with the characterization of these costs as "minor" and with the statement that the probabilities of redistricting as "slight to small."

Response: As indicated earlier in the Addendum, about 21,670 acres of Agricultural land are included in the intended designation. Of this, approximately 51 percent (10,980 acres) are owned by private landowners. Primarily ranching activities take place on the privately owned Agricultural land. As discussed above, assuming a worst-case scenario, and one which is NOT envisioned, reduction in land values due to redistricting all privately owned land from Agricultural to Conservation District ranges from \$11 million to \$110 million. Under this scenario, even if a landowner has no plans to sell the land, the loss in land value could reduce potential mortgage financing.

However, redistricting is likely to occur in only a limited number of cases, if any. This assessment is based upon discussions with the State officials, recognition of the procedural difficulty in approving redistricting, past landowner objections to redistricting, the limited number of parcels being redistricted during the last boundary review, and professional judgment.

7.c. Comment (Impact on Development)

A commenter stated the following: The DEA failed to consider economic impacts of critical habitat that result through interaction with State law, specifically Hawai'i Environmental Impact Statement Law. HRS 343-5 applies to any use of conservation land, and a full Environmental Impact Statement is required if any of the significance criteria listed in HAR 11-200-12 apply. One of these criteria is that an action is significant if it "substantially affects a rare, threatened or endangered species or its habitat." This will result in costly procedural requirements and delays. Another commenter expressed concerns that the Service may get involved in county permitting processes (as it did when Ulupalakua Ranch requested a Special Use Permit from the County of Maui for telecommunication purposes). Multiple commenters also stated the following: The DEA failed to evaluate the practical effect critical habitat designation will have on development. The draft failed to quantify the indirect costs that critical habitat designation could cause by making the process of obtaining State and county permits for development more difficult, expensive, and time consuming. Similarly, it should have taken into account the delays and additional cost to ensure compliance with Federal regulations. Special Management Area permits administered by Maui County as required by Hawai'i's Coastal Zone Management Act will be harder to get, will result in delays, will cause a decline in property values and may make it impossible to develop. This economic impact disappeared because the DEA's bottom line erroneously counted only so-called "direct" costs of consultation.

Another commenter also stated the following: The Service has taken the position in other states that it has a right to intervene in local land use proceedings if they affect endangered species on private property. For example, the Service petitioned the local zoning board in Arizona to postpone approval of a rezoning petition pending a survey to determine the extent to which an endangered plant was present on the property even though no Federal approval was being sought. The failure of the Service to address this type of activity in the DEA was a fundamental error of the analysis.

Response: Adverse impacts on development, including delays for additional studies and agency reviews, increased costs for environmental studies, increased risk of project denials, increased risk of costly mitigation measures, increased risk of litigation over approvals, etc., are not expected since there are no known development plans within the intended designation. Furthermore, the following factors make future development projects in the proposed critical habitat unlikely: (1) as modified, approximately 80 percent of the proposed critical habitat is in Conservation District where development is severely limited; (2) the approximately 20 percent of the proposed critical habitat in the Agricultural district is in remote areas, areas lined with gulches or steep cliffs, or areas with limited access to water; (3) there are no known plans for development within the intended critical habitat; and (4) most of the land intended for critical habitat designation that is in the Special Management Area is also within the Conservation District.

7.d. Comment (Impact on Water Use)

A commenter stated the following: The DEA failed to consider economic impacts of critical habitat that result through interaction with State law, specifically the State Water Code. HRS 174C-2 states "adequate provision shall be made for protection of fish and wildlife." HRS 174C-71 instructs the commission of Water Resource Management to establish an in-stream use protection program to protect fish and wildlife. Another commenter was concerned that critical habitat is proposed in watershed areas in which stream or irrigation system water flows. This commenter also stated the following: The proposed rule states that activities such as watershed alteration or water diversions may trigger section 7 consultations if there is Federal involvement. If the ability to divert or take water from these sources or systems is restricted or limited, the impact would be far reaching

and affect all lands served by such water sources or systems. The Service has an obligation to thoroughly investigate this issue and refrain from designating critical habitat until it has determined whether its actions will affect water use and balance this against any benefit to the species.

Response: No costs are expected to occur from such impacts to water systems, because none of the Plants are stream-dependent for their survival and therefore would not cause a reduction in water diversions. In addition, water infrastructures are considered a manmade feature and therefore its operation and maintenance are not subject to critical habitat provisions of section 7, because these features and structures normally do not contain, and are not likely to develop, any *primary constituent elements*.

7.e. Comment (New Water Diversions)

A commenter also expressed concerns that opponents of water diversions may use critical habitat as a tool to delay, and effectively stop, many worthwhile water diversion projects.

Response: Maui County and Department of Water Supply (DWS) submitted specific information regarding planned projects in the proposed critical habitat during the public comment period. Possible and planned projects by the DWS include water source development in Unit B2; construction of a water reservoir adjacent to Unit L; access and intake improvements in Unit L; and repair and maintenance of existing flumes in Unit L. As noted earlier, the Service indicates that it intends to remove Unit B2 from the final designation. Thus, no section 7 costs would be anticipated to result from future DWS projects in this area. Moreover, most of the identified DWS projects in Unit L involve repair and maintenance of existing man-made features and structures, and as such, would not be subject to section 7 consultation. However, to the extent that the planned improvements go beyond repair and maintenance and would be subject to section 7 consultation due to Federal funding or permitting, the DEA's estimate of zero to two consultations reasonably reflects the potential number of section 7 consultations over the next ten years (see Chapter VI, Section 3.k. of the DEA). The DEA estimated that the consultations could cost up to \$68,000 with project modifications that could range up to \$200,000. Importantly, however, the analysis concluded that it is unlikely that projects will not go forward altogether.

Future (i.e., currently unplanned) water diversion projects are most likely to be planned in mountainous areas with significant rainfall or existing water resources. In other words, they are most likely to occur in areas already in the Conservation District and thus, would be subject to discretionary approval by the State (BLNR). While development is already limited within the Conservation District, the designation of critical habitat would be relevant to BLNR's determination of whether to grant a permit. More specifically, the designation of critical habitat could make it more likely that BLNR would find that a proposed land use would cause substantial adverse impact to existing natural resources within the surrounding area (Hawai'i Administrative Rules § 13-5-30). Therefore, it is possible that critical habitat designation could result in additional environmental studies, project delays, project modifications, and potential project denials (as discussed generally in Chapter VI, Section 4.f. of the DEA). However, without more specific information on the scope and location of a future (and currently unplanned) water diversion project, it is not possible to meaningfully estimate the potential indirect costs associated with these events. As noted in the DEA, the costs could range from insignificant to substantial.

7.f. Comment (Economic Benefits)

Several commenters stated that the DEA focused primarily on the costs of critical habitat and lacks a thorough benefits analysis. It did not include the benefits of watershed protection and improvement or protection of other stream and riparian biota; the value of the Plants as an indicator

of ecological health; the value of protecting culturally significant species; the value that Hawai'i's people place on conservation of Hawaiian plants; and the benefits of keeping other native species off the endangered species list, of maintaining water quality and quantity, of promoting ground water recharge, and of preventing siltation of the marine environment, thus protecting coral reefs. The Service cannot exclude land from critical habitat designation if it considers only the costs, and not the benefits, of critical habitat designation. In failing to discuss these benefits, the Service missed an opportunity to educate the public regarding the value of protecting native species and native ecosystems. The Service must use the tools available, such as a study by the University of Hawai'i (UH) Secretariat for Conservation Biology that estimated the value of ecosystem services, to quantify the benefits of critical habitat. Conversely, another commenter stated that the alleged benefits are entirely speculative and unquantifiable, and that the Plants are of no use to anyone and lack commercial value. Another commenter points out that according to the DEA summary of costs and benefits, the benefits of designating critical habitat are "difficult to estimate" and are exceeded by the costs. Accordingly, the Service should exclude areas covered by the DEA from designation.

Response: There is little disagreement in the published economic literature that real social welfare benefits can result from the conservation and recovery of endangered and threatened species (Bishop (1978, 1980), Brookshire and Eubanks (1983), Boyle and Bishop (1986), Hageman (1985), Samples et al. (1986), Stoll and Johnson (1984)). Such benefits have also been ascribed to preservation of open space and biodiversity (see examples in Pearce and Moran (1994) and Fausold and Lilieholm (1999)), both of which are associated with species conservation. Likewise, a regional economy can benefit from the preservation of healthy populations of endangered and threatened species, and the habitat on which these species depend.

Chapter VI, Section 6 of the DEA discussed potential benefits, both direct and indirect, that can result from the proposed designation. The DEA noted that the proposed designation can create ecological and cultural benefits such as the ones mentioned in the above comment—e.g., ethnobotanical value of plants to the Native Hawaiians and social welfare benefits of ecological improvements. However, the DEA also indicated that these benefits are not quantified due to lack of information available on (1) quantified data on the value of the Maui and Kaho'olawe species; and (2) quantified data on the change in the quality of the ecosystem and the species as a result of the designation. The DEA, however, did not conclude that the benefits are exceeded by the costs. Instead, it discussed the benefits that could result from critical habitat designation in qualitative terms.

While section 4(b)(1)(A) of the Act stipulates that listing determinations must be made solely on the basis of biological evidence, section 4(b)(2) of the Act, which calls for the establishment of critical habitat for all listed species if it is prudent and determinable, adds that the Secretary should take into consideration the economic impact of the designation and any other relevant impacts before specifying any particular area as critical habitat. Hence, an economic analysis is part of the process of designating critical habitat. Section 4(b)(2) of the Act provides the Secretary with broad discretion to take into consideration the economic impacts of any proposed critical habitat designation and exclude areas where she finds that the benefits of exclusion outweigh the benefits of designation:

The Secretary may exclude any area from critical habitat if he determines that the benefits of exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he determines, based on the best scientific and commercial data available, the failure to designate such area as critical habitat will result in the extinction of the species concerned. (16 U.S.C. §1533(b)(2).)

Thus, the Secretary is not required to find that the benefits of inclusion outweigh the costs of inclusion before designating an area, nor is the Secretary required to exclude an area from critical habitat if she determines that the benefits of exclusion outweigh the benefits of inclusion. Rather, the Act provides the Secretary with the discretion to take economic consideration into account when designating critical habitat.

As such, the DEA and the Addendum serve to illustrate possible impacts that can result from the designation, whether in form of costs or benefit. However, the DEA and the Addendum are not intended to provide a comprehensive analysis of the benefits that could result from section 7 of the Act in general, or of critical habitat in particular. In short, the Service believes that the benefits of critical habitat designation are best expressed in biological terms that can be weighed against the expected costs of the rulemaking. The DEA and the Addendum simply provide information for the Secretary to exercise her discretion, but do not provide definitive conclusions or recommendations as to what areas, if any, should be excluded from the final designation.

Finally, although the UH study does value ecosystem services, it has limited applicability for valuing the benefits of the proposed critical habitat designation for the Plants for a number of reasons. First, the UH study had a different purpose, which was to estimate the total value of environmental benefits provided by the entire Ko'olau Mountains on the island of O'ahu versus the value of the more limited benefits provided by the proposed critical habitat for the Plants on the islands of Maui and Kaho'olawe. Consistent with its purpose, the UH study provided no estimates of the changes in environmental conditions resulting from changes in land and stream management due to critical habitat designation.

Furthermore, many of the assumptions and much of the analysis in the UH study are not transferable to the economic analysis for the Plants critical habitat. For example, the value of water recharge in the UH study reflects projected water supply and demand conditions on O'ahu—an island 3/4 of the size of Maui but has a population of nearly ten times that of Maui. Also, the UH benefit analysis of reducing soil runoff is unique to three valleys that drain through partially channelized streams in urban areas into the man-made Ala Wai Canal. Since this canal was designed with inadequate flushing from stream or ocean currents, it functions as an unintended settling basin that must be dredged periodically. In addition, the recreational and ecotourism values provided in the UH study apply to areas that are accessible to most hikers, which is not the case with significant portions of the Plants critical habitat. Significant portions of the Plants critical habitat units are in mountainous range with steep slopes and difficult access and on coastal cliffs.

7.g. Comment (Ecotourism)

One commenter stated the following: Critical habitat does not benefit ecotourism by creating new special places for people to visit, as the DEA suggested. Rather, it helps to protect the special places that already exist from degradation, ensuring that they will be around in the future to attract future ecotourists. Moreover, the Service's subjective preference that commercial operators not feature visits to view threatened and endangered plants has no place in an objective economic analysis.

Response: Chapter VI, Section 6.b.(1) of the DEA indicated that the proposed critical habitat may enhance the appeal of ecotourism by providing a marketing dimension. However, the DEA also stated that this benefit may be slight since these places may already be regarded as special due to the existing natural and cultural resources in the area.

7.h. Comment (Economic Time Frame)

The DEA underestimated economic costs because they are limited to what is likely to occur within ten years. Critical habitat designation is permanent and not automatically revised if there is new evidence of the benefits of non-designation, or if the species is delisted.

Response: A listed species is delisted when it is recovered or has gone extinct. Recovery is defined as no longer needing the protections provided by the Act, including critical habitat. As such, when a species is delisted, its critical habitat would also be undesignated.

Furthermore, a ten-year time horizon is used because many landowners and managers do not have specific plans for projects beyond ten years. In addition, the forecasts in the analysis of future economic activity are based on current socioeconomic trends and the current level of technology, both of which are likely to change over the long term.

7.i. Comment (Investigative Costs)

A commenter stated the following: The DEA dismissed concerns about impacts on the use of structures and features already placed in areas to be designated as critical habitat. The draft conceded that the lack of clarity can force landowners to incur costs to investigate the implications of the regulations. The estimate that this will only take 15-40 hours is too low given the size of the designated areas, the vagueness of the regulatory exclusion, and the real costs of obtaining development approvals.

Another commenter also stated that the DEA's analysis of potential costs expected to be incurred by private landowners to investigate the implications of critical habitat on their lands was flawed, because the analysis failed to recognize that the cost to investigate the implications of CH is a sunk cost associated with the designation process, not an additional cost that the final designation would impose.

Response: Chapter VI, Section 4.i. of the DEA indicated that the landowner may want to learn how the designation may affect (1) the use of his land (either through restrictions or new obligations), and (2) the value of his land. However, since the commenter did not provide an alternative estimate of time or cost incurred in order to investigate implications of critical habitat, this Addendum does not revise the number of hours that the landowner and/or his attorneys or professional staff would spend on investigating the issues. However, the Addendum does revise the number of affected landowners to 26 because of the intended modifications to the critical habitat indicated by the Service. As described earlier in the Addendum, using these new assumptions, the analysis estimates that total section 7 costs range from \$31,800 to \$247,000.

While some landowners may expend time and money to investigate the implications of critical habitat on their land during the designation process, many landowners may not do so until after final designation is complete. Thus, the DEA and the Addendum treat these costs as costs attributable to the final designation.

7.j. Comment (Impact of Take Provision under State Law)

One commenter stated the following: The DEA failed to consider the economic impacts of listing and critical habitat that result through interaction with State law, specifically Hawai'i's Endangered Species Act. New Mexico Cattle Growers Association v. U.S. Fish and Wildlife Service requires consideration of the impact of listing as well as the impact of designating an area as critical habitat. Instead, the analysis is expressly limited to the impact of Federal agency consultation under the jeopardy standard. Since Federal listing triggers listing under State law, the

Service must consider the impact of take prohibitions under State law (and consequently Federal law, which prohibits destruction of plants in knowing violation of State law). Violations of these laws can trigger lawsuits.

Response: The DEA considered the economic impacts of section 7 consultations related to critical habitat even if they are attributable coextensively to the listed status of the species. In addition, the DEA examined any indirect costs of critical habitat designation such as where critical habitat triggers the applicability of a State or local statute. However, where it is the listing of a species that prompts action at the State or local level, the impacts are not attributable to critical habitat designation and are not appropriately considered in the economic analysis of critical habitat designation. *Take* prohibitions under Hawai‘i law are purely attributable to a listing decision and do not coextensively occur because of critical habitat designations. There are no *take* prohibitions associated with the Plants critical habitat.

7.k. Comment (Agriculture)

Multiple commenters opposed the designation of Agricultural lands needed to support agriculture and ranching and stated the following: Critical habitat designation would reduce property values and the ability to develop lands that were previously planned for development. Approximately 77 percent of the proposed designated land is within the State Conservation District, which includes irrigation water essential to agriculture. The rest of the lands proposed for designation are in the State Agricultural District. Designation of Agricultural lands could prevent a farmer or rancher from using those lands since the very nature of those uses would in all likelihood entail cutting, uprooting, or injuring plants to a certain extent. The DEA failed to examine the economic impact of a landowner not being able to use his own land for fear of injuring a species he doesn’t even recognize. No protection is afforded to farmers who unwittingly “harm” the designated critical habitat. A careful cost-benefit analysis should conclude that Agricultural lands should be excluded.

Response: There are no *take* provisions associated with the Plants critical habitat. Section 7 of the Act requires only that Federal agencies consult with the Service to ensure that activities they fund, authorize, permit or carry out do not result in destruction or *adverse modification* of critical habitat. Because consultation under section 7 only applies to activities that have *Federal involvement*, the designation of critical habitat does not afford any additional protections for listed species with respect to strictly private activities. As such, designation of critical habitat on agricultural lands would not prevent a private farmer or rancher from farming or ranching on their land, unless the activity had *Federal involvement*, such as through participation in federally sponsored agricultural or ranching programs.

Chapter VI, Section 3.g. of the DEA presented estimates of section 7 costs associated with participation in federally sponsored agricultural or ranching related programs, such as Farm Bill programs administered by NRCS. The DEA based its estimate of two to eight consultations over the next ten years on the amount of Agricultural land contained within the proposed designation; number of past projects located within the area proposed for designation; and the possibility that some landowners could decide not to participate in future programs to avoid Federal involvement in their activities.

The Service indicates that it intends to reduce the amount of Agricultural land designated from 29,175 acres to 21,670 acres, a reduction of 25 percent. The intended designation would contain approximately 10,980 acres of Agricultural land owned by those most likely to participate in NRCS programs: private landowners. However, the majority of this land, approximately 9,028

acres, is owned by two landowners who indicated during public comment that they will not participate in future NRCS programs if their land was designated as critical habitat. Moreover, as noted in the DEA, not all of the Agricultural land intended for designation is in active agricultural use. Finally, competition for NRCS funding is strong. Based upon the intended modifications and the new information, the Addendum adjusts the direct section 7 costs accordingly. The Addendum estimates that the consultation cost can range from \$0 to \$41,200, with a project modification cost ranging from \$0 to \$100,000.

With the Service's intended modification, no development projects are planned for these Agricultural lands within the next ten years. However, other indirect impacts that could result from the designation of critical habitat are discussed in Chapter VI, Section 4 of the DEA and Section 5 of this Addendum. First, the critical habitat designation may reduce property value of these Agricultural lands. In the worst case scenario, one which is NOT envisioned, reduction in land values due to redistricting all Agricultural land in the intended designation to the Conservation District could range from \$11 million to \$110 million. In addition, critical habitat could result in the cessation of existing agricultural activities. While the likelihood of this being mandated as a result of critical habitat designation is low, the estimated costs resulting from stopping all ranching activities within the intended designation ranges from \$110,000 to \$825,000 per year.

7.l. Comment (Indirect Costs)

Many commenters stated the following: the DEA failed to adequately assess the scope of indirect costs associated with critical habitat designation. Indirect impacts cannot be dismissed just because it is difficult to assign a dollar value to them. Without acknowledging the full scope of direct and indirect costs, the Service cannot complete an accurate final determination of critical habitat. Another commenter also stated that the DEA should be amended to properly reflect all economic impacts, including the various indirect impacts, which would clearly show that the economic cost of critical habitat designation is significantly higher than the benefits.

Response: Chapter VI, Section 4 of the DEA and Section 5 of this Addendum discuss various indirect impacts that can result from the designation. There is considerable uncertainty on whether any or all of these indirect impacts may occur, as they depend upon actions and decisions by entities other than the Service under circumstances for which there is limited or no history that can be used to determine the probability of different outcomes. Thus, based on the available information, these impacts were discussed qualitatively in the DEA and where possible, estimates were given of worst-case scenarios for illustrative purposes.

7.m. Comment (Hunting)

Several commenters stated the following: Critical habitat designation has potential to decrease the amount of available hunting lands and game animals. Governmental officials seem to value plants and insects more than hunting, which is an important family and cultural tradition, a means of subsistence, and a way of life. Members of all ethnic groups hunt and depend on subsistence activities as a real part of their income. Hunting also contributes to the economy via money spent on pet foods, inter island trips, gasoline, supplies, etc. Additionally, DLNR will lose money as the demand for hunting licenses and tag fees dwindles. The DEA did not adequately reflect the costs associated with management of game mammals and loss of hunting lands. Another commenter questioned why a cost was associated with project modifications to the management of game hunting on State managed lands because Maui does not have any State hunting areas that are managed to maintain or enhance game mammal populations. The commenters also questioned the methodology used to estimate the project modification cost.

Response: Chapter VI, Section 3.a.(2) and Section 4.a. of this Addendum discuss the direct economic impact of critical habitat designation on federally funded game management activities by estimating the direct section 7 costs associated with consultation and project modifications. The DEA made the assumption that the cost of past project modifications only incorporates the portions of the hunting units that overlap with the *occupied* proposed critical habitat. However, information received during public comment noted that the prior consultation already modified the State's proposed game mammal program to address potential impacts to habitat everywhere on the island, including *occupied* and *unoccupied* habitat and areas inside and outside of critical habitat designation, based on the understanding that increasing game mammal populations in one location where the Plants are not present may cause those mammals to move to areas where the Plants are present and cause destruction. Upon further review of past consultations and past project modifications, the project modification costs are now estimated at \$23,000 to \$37,000. As noted in the DEA, because Maui does not have any State hunting areas that are managed to maintain or enhance game mammal populations, project modifications are anticipated to be similar to those in the past. They are not anticipated to include closure of hunting areas. In addition, as noted in the DEA, DLNR is likely to avoid costly project modifications by using Federal funds for game management projects that do not adversely affect listed species or their critical habitat, and if needed use only State funds on projects that the Service believes could have adverse impacts.

Chapter VI, Section 4.b. of the DEA and Section 5.a. of this Addendum discuss the potential indirect impact of critical habitat on the management of game mammals. The DEA noted that section 7 of the Act by itself does not require DLNR to manage State hunting lands to protect critical habitat; assure the survival and conservation of listed species; or participate in projects to recover species for which critical habitat has been established. Moreover, the DEA noted that critical habitat designation does not require (1) creating any reserve, refuge, or wilderness areas; (2) fencing for any reason; (3) removing ungulates; or (4) closing areas to hunters. However, the DEA recognized that a change in game-management strategy is possible as a result of a lawsuit or as a voluntary decision by DLNR. For illustration purposes, Chapter VI, Section 4.b. of the DEA and Section 5.a. of this Addendum present potential costs that could result if DLNR removed areas within the intended designation from the State managed hunting units. Assuming that about half of those who hunt game mammals on the affected lands were to give up hunting, then hunting activity on Maui could drop by about 14.5 percent. This drop in hunting activity would translate into a decrease in annual economic activity related to hunting on Maui of about \$290,000 in direct sales (14.5% of \$2 million); \$510,000 in total direct and indirect sales (14.5% of \$3.5 million); nine jobs (14.5% of 60 jobs); and \$170,000 in income (14.5% of \$1.2 million). However, the decrease in expenditures by the displaced hunters would probably be spent on other recreational activities, goods and services, so these figures are likely to overstate the economic costs. In addition to the change in economic activity discussed above, a reduction in hunting activity in critical habitat would also result in a loss in value or benefit to hunters (consumers' surplus). Section 5.a. of the Addendum estimates this loss in value at \$150,000 annually and recognizes that benefits derived from recreational activities that replace game mammal hunting would partially offset this loss.

7.n. Comment (Shoreline Development)

A commenter stated the following: The proposal identified portions of five habitat units (Units C1, C2, C3, G1, and G5), which consist in part of private lands and are occupied by only one or two species, which have known current populations on other islands. Portions of these units may have economic value to their respective landowners for eventual shoreline development or as sources of surface water for irrigation.

Response: As discussed earlier, the Service intends to remove Units C1 and C2 and substantially reduce Unit C3. The State of Hawai'i owns 99 percent of the land (174 acres) intended for designation in Unit C3 and 53 percent of the land (40 acres) intended for designation in Unit G5. The remaining land (less than one acre in Unit C3, nine acres in Unit G1 and 34 acres in Unit G5) is owned by private landowners. There are no known plans for shoreline or water source development within the remaining units (i.e., Units C3, G1 and G5). Because none of the Plants are stream-dependent for their survival, they would not cause a reduction in any existing water diversions. Furthermore, all of these units are in Conservation District and in the Special Management Area where development is severely limited.

7.o. Comment (Exclusion)

A commenter stated that three parcels (TMK (2) 1-8-001:003, TMK (2) 3-1-001:004, and TMK (2) 3-1-002:011) should be excluded from designation, because the DEA failed to establish that the benefits of including these parcels in the designation outweigh the costs of including these parcels in the designation.

Response: The Service indicates that it intends to remove two of the three parcels mentioned in the comment—i.e., TMK (2) 3-1-001:004 and TMK (2) 3-1-002:011—from the proposed designation. The remaining parcel—i.e., TMK (2) 1-8-001:003—is approximately 710 acres in the Agricultural District, and this would remain within the intended designation. Chapter VI, Section 3.g. of the DEA and Section 4.e. of the Addendum discuss activities on Agricultural land and specifically recognizes that some of the State managed Agricultural land is leased out to private entities as pasturage. However, no direct section 7 costs involving these leases are anticipated because there is no known *Federal involvement*.

While section 4(b)(1)(A) of the Act stipulates that listing determinations must be made solely on the basis of biological evidence, section 4(b)(2) of the Act, which calls for the establishment of critical habitat for all listed species if it is prudent and determinable, adds that the Secretary should take into consideration the economic impact of the designation and any other relevant impacts before specifying any particular area as critical habitat. Hence, an economic analysis is part of the process of designating critical habitat. Section 4(b)(2) of the Act provides the Secretary with broad discretion to take into consideration the economic impacts of any proposed critical habitat designation and exclude areas where she finds that the benefits of exclusion outweigh the benefits of designation:

The Secretary may exclude any area from critical habitat if he determines that the benefits of exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he determines, based on the best scientific and commercial data available, the failure to designate such area as critical habitat will result in the extinction of the species concerned. (16 U.S.C. §1533(b)(2).)

Thus, the Secretary is not required to find that the benefits of inclusion outweigh the costs of inclusion before designating an area, nor is the Secretary required to exclude an area from critical habitat if she determines that the benefits of exclusion outweigh the benefits of inclusion. Rather, the Act provides the Secretary with the discretion to take economic consideration into account when designating critical habitat.

As such, the DEA and the Addendum serve to illustrate possible impacts that can result from the designation, whether in form of costs or benefit. They provide information for the Secretary to exercise her discretion, but do not provide definitive conclusions or recommendations as to what areas, if any, should be excluded from the final designation.

7.p. Comment (Federal Nexus)

A commenter stated the following: While the Service has stated that critical habitat affects only activities that require Federal permits or funding, and does not require landowners to carry out special management or restrict use of their land, they fail to address the breadth of Federal activities that affect private property in Hawai‘i and the extent to which private landowners are required to obtain Federal approval before they can use their property. These requirements extend to all State agencies using Federal funds in connection with a proposed action and community actions for which Federal approval or review is necessary. For example, if the Federal government approves eligibility for flood insurance, flood plain development programs shall become subject to consultations under the Act. Federal agencies such as the U.S. Department of Agriculture and the Federal Farm Services Agency (FFSA) have numerous programs that provide funds or other assistance to farmers and ranchers in the form of loans, grants, loan deficiency, and subsidy payments for certain commodities, marketing assistance, disaster assistance, and other financial, technical, and educational assistance. Participation in any such programs would be subject to section 7 consultation, thus making Federal assistance unavailable to the types of operations that these programs are designed to assist.

Response: The analysis in the DEA, as revised by the Addendum, was based on a review of all “reasonably foreseeable” projects, land uses, and activities that may be directly affected by the implementation of section 7 for the Plants. “Reasonably foreseeable” projects, land uses, and activities are defined in the DEA as those which are (1) currently authorized, permitted, or funded; (2) proposed in plans currently available to the public; or (3) projected or likely to occur within next ten years based on (a) recent economic or land-use trends, development patterns, evolving technologies, competitive advantages, etc., and (b) limits imposed by land-use controls, access, terrain, infrastructure and other restrictions on development. After determining the “reasonably foreseeable” projects, land uses, and activities that could affect the physical and biological features of the proposed critical habitat units, the next step in the analysis was to determine Federal involvement. Thus, the DEA did not evaluate all potential activities with Federal nexus; instead the DEA was limited to those that were “reasonably foreseeable.” The results of this analysis are presented in Table VI-3 in the DEA and Table Add-2 in the Addendum.

7.q. Comment (Impact on Urban, Agricultural and Rural Lands)

Two commenters wrote that lands in Urban, Agricultural, and Rural Districts are designated, used, and intended for a wide variety of land use activities. These commenters stated that there is much greater likelihood, therefore, that critical habitat designation will have an adverse economic impact on these landowners.

Response: None of the intended critical habitat units are in the Urban or Rural District. In fact, 80 percent of the intended critical habitat designation is in the Conservation District and 20 percent in the Agricultural District. As discussed above, designation of the Agricultural lands may result in direct section 7 costs through federally sponsored agricultural or ranching related programs, such as Farm Bill programs administered by NRCS. The DEA based its estimate of two to eight consultations over the next ten years on the amount of Agricultural land contained within the proposed designation; number of past projects located within the area proposed for designation; and the possibility that some landowners could decide not to participate in future programs to avoid Federal involvement in their activities.

The Service indicates that it intends to reduce the amount of Agricultural land designated from 29,175 acres to 21,670 acres, a reduction of 25 percent. The intended designation would

contain approximately 10,980 acres of Agricultural land owned by those most likely to participate in NRCS programs, private landowners. However, the majority of this land, approximately 9,028 acres, is owned by two landowners who indicated during public comment that they will not participate in future NRCS programs if their land was designated as critical habitat. Moreover, as noted in the DEA, not all of the Agricultural land intended for designation is in active agricultural use. Finally, competition for NRCS funding is strong. Based upon the intended modifications and the new information, the Addendum adjusts the direct section 7 costs accordingly. The Addendum estimates that the consultation cost can range from \$0 to \$41,200, with a project modification cost ranging from \$0 to \$100,000.

With the Service's intended modification of the proposed designation, no development projects are planned for these Agricultural lands within the next ten years. However, other indirect impacts that could result from the designation of critical habitat are discussed in Chapter VI, Section 4 of the DEA and Section 5 of this Addendum. First, the proposed critical habitat may reduce property value of these Agricultural lands. In the worst case scenario, one which is NOT envisioned, reduction in land values due to redistricting all Agricultural land in the intended designation to the Conservation District could range from \$11 million to \$110 million. In addition, the proposed critical habitat could result in the cessation of existing agricultural activities. While the likelihood of this being mandated as a result of critical habitat designation is low, the estimated costs resulting from stopping all ranching activities within the intended designation ranges from \$110,000 to \$825,000 per year.

7.r. Comment (Forced Conservation Management)

Several commenters stated the following: Although the Service has expressed that designation of critical habitat does not create a reserve, refuge, or wilderness area, require fencing for any reason, close off areas to hunters, hikers, or other land users, or create a land management plan, many are concerned that critical habitat designation could result in limitations or special management requirements (such as fencing, removal of grazing animals, or control of invasive species) being established on private lands at great expense to the private and public. The Service's own recovery plans for many of the species in the proposed rule specifically identify cattle grazing as a potential threat to the species or their habitats. Many feel that it is likely that private party litigation will force the implementation of "special management considerations or protection." An example of this is the worrisome precedent of Palila v. Hawai'i Department of Land and Natural Resources in which the Sierra Club Legal Defense Fund sued the State of Hawai'i under the Endangered Species Act and resulted in a Federal court order specifying that sheep and goats should be permanently removed from critical habitat designated for palila on the Big Island. The argument against this case being relevant for the Plants critical habitat is not persuasive when it argues that palila cases are irrelevant to Hawai'i ESA law because the Federal Act defines "take" as "harm" while the State law defines "take" as "injure." "Harm" and "injure" are generally synonymous. The cost of such special management should be considered prior to a final determination on the proposed designations. Where costs are likely to outweigh the benefits of the proposed designation, designation of critical habitat should be determined not to be prudent, or at a minimum, areas proposed for designation should be significantly reduced so that any special management measures that may eventually be mandated through litigation are of a scale that is reasonable and cost-effective to implement.

Another commenter expressed concerns that the proposed critical habitat would bring private party lawsuits resulting in mandated protection for critical habitat. Another commenter also stated that in Hawai'i it has long been established that landowners own all feral animals on their property. The commenter expressed concerns that plaintiffs who seek to compel a private landowner to spend

money to protect critical habitat could argue that the landowner has a positive obligation to ensure that such animals do not harm the habitat.

Response: Absent a *Federal nexus*, section 7 of the Act does not obligate landowners to manage their land to protect critical habitat, nor does it obligate landowners and managers to participate in projects to recover a species for which critical habitat has been established. However, Chapter VI, Section 4.c. of the DEA did discuss the potential mandate for conservation management pursuant to litigation and the resulting costs for the proposed designation on Maui. In addition, Chapter VI, Section 4.f. of the DEA, discussed the potential for adverse impacts on development, including delays for additional studies and agency reviews, increased costs for environmental studies, increased risk of project denials, increased risk of costly mitigation measures, increased risk of litigation over approvals, etc. The DEA concluded that it is impossible to quantify these potential costs, because there are no known development plans within the proposed designation, as intended to be modified. Furthermore, the following factors make future development projects in the proposed critical habitat highly unlikely: (1) 80 percent of the intended critical habitat is in the Conservation District where development is severely limited; (2) the approximately 20 percent of the intended critical habitat in the Agricultural District is in remote areas, areas lined with gulches or steep cliffs, or areas with limited access to water; (3) there are no known plans for development within the intended designation; and (4) most of the intended critical habitat are in the Special Management Area is also within the Conservation District. While it is conceivable that there may initially be an increase in subsequent lawsuits related to the critical habitat designation, it is not possible to predict their number, degree of complexity, or any other associated effect due to scant historical evidence for the Plants.

7.s. Comment (Cost of Litigation)

Several commenters were concerned that critical habitat designation will lead to unnecessary and costly litigation. Another commenter was concerned about the likelihood of private party lawsuits limiting current ranch operations.

Response: As discussed in the DEA and the Addendum, an undetermined probability exists that a Federal or State court could mandate certain indirect impacts as a result of critical habitat. However, it is beyond the scope of the economic analysis to assess the legal merits of the arguments for or against the various indirect impacts, the probability that a lawsuit will be filed, and, if filed, to identify possible outcomes of a court decision and the associated probabilities. However, whenever possible, the DEA and the Addendum present the worst-case scenario of the costs associated with the potential outcomes of third party lawsuits.

7.t. Comment (Maui Land and Pineapple)

ML&P believes that designation of critical habitat would adversely impact the value of agricultural lands and lands proposed for future development, and reduce the collateralized value of land holdings, and due to State and county law, reduce the ability to develop lands previously planned for development. The impacted lands include areas described in the proposed units A, C1, C2 and C3.

Response: As discussed above, the Service intends to remove Units C1 and C2 and reduce Units A and C3. After this intended modification, less than one acre of ML&P's land in Units A and C3 remains within the intended designation. As such, minimal impacts are anticipated for ML&P's Agricultural land in Units A and C3.

7.u. Comment (Maui Department of Water Supply)

The Maui County Department of Water Supply provided the following information on planned projects occurring in proposed units L, G, and B2: These projects include access improvements, intake improvements, reservoir design and construction, well construction, flume repair and maintenance, water distribution system maintenance, study, and potential sources for future groundwater. Whether these or other projects would involve Federal lands, funding, or permits, it is important that water treatment plants, sources, and collection and distribution systems can continue to be established and maintained within these areas where they are needed for hydro-geological and security reasons.

Response: Maui County and Department of Water Supply (DWS) submitted specific information regarding planned projects in the proposed critical habitat during the public comment period. Possible and planned projects include water source development in Unit B2; construction of a water reservoir adjacent to Unit L; access and intake improvements in Unit L; and repair and maintenance of existing flumes in Unit L. As noted earlier, the Service indicates that it intends to remove Unit B2 from the final designation. Thus, no section 7 costs would be anticipated to result from future DWS projects in this area. Moreover, most of the identified DWS projects in Unit L involve repair and maintenance of existing man-made features and structures, and as such, would not be subject to section 7 consultation. However, to the extent that the planned improvements go beyond repair and maintenance and would be subject to section 7 consultation due to Federal funding or permitting, the DEA's estimate of zero to two consultations reasonably reflects the potential number of section 7 consultations over the next ten years (see Chapter VI, Section 3.k. of the DEA). The DEA estimated that the consultations could cost up to \$68,000 with project modification that could range up to \$200,000.

7.v. Comment (Impact on Ranching)

Ulupalakua Ranch expressed concerns that the proposed critical habitat will 1) limit development of diversified agricultural operations due to the Ranch's interest in Federal cost share programs; 2) cause a loss in revenue; 3) create economic hardship resulting from increased expenses to counter trespassing due to increased curiosity over critical habitat lands; and 4) lower economic returns and job loss due to critical habitat dividing up sections of the ranch, thus leading to inefficiency.

Response: Chapter III of the DEA noted that section 7 of the Act requires Federal agencies to consult with the Service to ensure that activities they fund, authorize, permit or carry out do not result in destruction or *adverse modification* of critical habitat. Because consultation under section 7 only applies to activities that have *Federal involvement*, the designation of critical habitat does not afford any additional protections for listed species with respect to strictly private activities.

Chapter VI, Section 3.g.(2) of the DEA and Section 4.e. of the Addendum present estimates of direct section 7 costs associated with participation in Federal cost-share programs with NRCS. The Addendum estimates that total consultation costs for all projects in the intended critical habitat designation range from \$0 to \$41,200, while project modification costs range from \$0 to \$100,000. The DEA and the Addendum both note that projects sponsored by NRCS programs are generally beneficial in nature and are likely to involve minimal project modifications. However, the DEA and the Addendum recognize that a landowner could decide to forego Federal funding and cancel the contract with NRCS to avoid making modifications identified through the section 7 consultation process. Ulupalakua Ranch participated in the Environmental Quality Incentives Program (EQIP) in 2001 and received approximately \$22,000. If Ulupalakua Ranch were to be one of the anticipated consultations over the next ten years, and if the section 7 consultation process resulted in project

modifications that would limit the development of diversified agricultural operations, then Ulupalakua Ranch could avoid these project modifications by foregoing Federal funding, thus removing the *Federal involvement*. The cost of project modifications in that case would be the total amount of Federal funding foregone. Over the past five years, Ulupalakua Ranch has received approximately \$22,000 from NRCS. Assuming that future funding levels would be similar to past funding, an estimate of the potential Federal funding foregone over the next ten years would be \$44,000. If no Federal involvement exists, there can be no direct section 7 costs associated with critical habitat designation on Ulupalakua Ranch lands.

The remaining three concerns raised above by Ulupalakua Ranch, specifically that critical habitat designation will cause loss in revenue, create economic hardship resulting from increased expenses to counter trespassing due to increased curiosity over critical habitat lands, and lower economic returns and job loss due to critical habitat dividing up sections of the ranch, are concerns about indirect impacts of critical habitat designation.

There is considerable uncertainty on whether any or all of these indirect impacts may occur, as they depend upon actions and decisions by entities other than the Service under circumstances for which there is limited or no history that can be used to determine the probability of different outcomes. To the extent possible, the possible costs associated with these impacts are discussed in Chapter VI, Section 4 of the DEA and Section 5 of the Addendum. However, based on the limited information available, it is not possible to determine the probability that any of these impacts will actually occur as a result of critical habitat designation.

7.w. Comment (Department of Hawaiian Homelands)

The Department of Hawaiian Homelands (DHHL) opposes the designation of critical habitat on their land in Unit E and H because the currently degraded land is slated for development of homes for native Hawaiian beneficiaries. DHHL further noted that critical habitat designation will cause significant economic harm, because: 1) the designation of critical habitat would require hundreds of future beneficiaries to conduct an environmental assessment and section 7 consultation in order to construct homes and prepare ground for farming; 2) the identified areas have already been subdivided into individual lots and DHHL does not have the authority to retroactively impose management plans on individual lessees, meaning that any regulatory impact will fall on individual lessees; 3) DHHL's homesteading program uses Federal programs to guarantee and insure the mortgages of homesteaders; 4) Federal funds may be used construct site improvements and homes; and 5) to the extent that the use of these programs triggers consultation under section 7, lessees will be subject to additional filing requirements, delays in homebuilding, possible additional expenditures, and limitations on property use. DHHL supports the proposed designations in areas that are not subject to homestead development such as the cliff face found in unit G4.

Response: As discussed earlier, the Service intends to reduce Units E and H to exclude certain areas, including DHHL land subject to homestead development. As such, possible impacts discussed in the comment are not expected.

7.x. Comment (Taking Private Property)

A commenter stated the following: The Service did not adequately address the takings of private property as a result of designating critical habitat for endangered plants on Maui. If the critical habitat proposal would require reducing water diversions from any stream, the Service should investigate whether that would take anyone's vested water rights. In addition, if the proposed designation of critical habitat precipitates conversion of agricultural lands to conservation land that has no economically beneficial use, then the Federal and State governments will have taken private

property. In addition, the government may also take property by excessive regulation as was evidenced in *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003 (1992).

Response: As noted above, none of the Plants are stream-dependent for their survival and therefore would not cause a reduction in water diversion. Also, Chapter VI, Section 4.e. of the DEA and this Addendum address costs involved in redistricting lands from the Agricultural District to the Conservation District. About 20 percent of the intended designation is in the Agricultural District. In the event that all of these lands are redistricted to the Conservation District, the loss in property value could range from \$11 million to \$110 million. However, the probability of redistricting is small for the following reasons: 1) critical habitat alone would not prompt the State to propose redistricting; 2) approval of redistricting requires six affirmative votes from nine commissioners, with the decision based on a “clear preponderance of the evidence that the proposed boundary is reasonable” (HRS 205-4); 3) private landowners strongly oppose redistricting proposals if they believe this might result in a decrease in property value and/or a loss in the economic use of their lands; and 4) only four privately owned parcels were redistricted to Conservation in the last State District boundary review.

7.y. Comment (Nonpoint Source Water Discharge)

One commenter notes that a Federal nexus exists for the non-point source water discharge program. This commenter was concerned that if water discharge into critical habitat does not meet water quality standards, a permit could be denied. The commenters propose that the effect on agriculture may be devastating since some run-off from agricultural activities is unavoidable.

Response: The State Department of Health Polluted Runoff Control Program and the State Office of Planning, Coastal Zone Management Program, work together to address nonpoint source pollution through outreach and education and programs that utilize incentives. Under the Coastal Zone Act Reauthorization Amendments, Section 6217, the State is required to meet various conditions for approval of the State’s Coastal Nonpoint Pollution Control Program by the U.S. Environmental Protection Agency. To meet these conditions, the State Department of Health is developing administrative rules to create Statewide enforceable policies and mechanisms to address nonpoint source pollution. These draft rules are currently the subject of public informational meetings. Public comments and suggestions received during these meetings will be considered before final rules are drafted and proposed to the Governor.

At the present time, there is no permit requirement for nonpoint source pollution. Moreover, the proposed rules regarding nonpoint source pollution makes no reference to either water quality standards or to critical habitat. Until the State administrative rules are finalized, the economic impact caused by the interplay of nonpoint source pollution requirements and the designation of critical habitat is entirely speculative.

7.z. Comment (U.S. Navy)

A commenter stated the following: The designation will also impose costly procedural burdens on the Navy’s ongoing efforts to clear ordnance at Kaho‘olawe. A careful analysis of the benefits and burdens of critical habitat designation may result in a determination that critical habitat designation on Kaho‘olawe is not prudent, especially in light of potential prescribed burns for clearing ordnance.

Response: Chapter VI, Section 3.e. of the DEA noted that November 2003 marks the end of the Navy’s congressionally-mandated cleanup period. After that point, Kaho‘olawe Island Reserve Commission (KIRC) is likely to seek some form of Federal assistance. In the event that KIRC

receives Federal funding in the future, the DEA estimated section 7 consultation costs at \$10,400 to \$78,500 with minor project modification costs (based on two to five consultations). However, as noted above, the Service intends to reduce the designation on Kaho‘olawe, and the number of section 7 consultations over the next ten years would be expected to decrease to zero to three consultations as a result. As such, the Addendum revises future section 7 consultation costs to range from \$0 to \$47,100.

7.aa. Comment (Utility of Critical Habitat Designation)

Many commenters questioned the utility of critical habitat designation because it will not result in on-the-ground improvement of habitat or endangered species. Conversely, some commenters pointed out that critical habitat will prevent the Federal government from carrying out activities that destroy habitat or species in need of recovery and that it will benefit the people of Maui by preserving native forests, thus preventing erosion that pollutes water and smothers reefs.

Response: There is little disagreement in the published economic literature that real social welfare benefits can result from the conservation and recovery of endangered and threatened species (Bishop (1978, 1980), Brookshire and Eubanks (1983), Boyle and Bishop (1986), Hageman (1985), Samples et al. (1986), Stoll and Johnson (1984)). Such benefits have also been ascribed to preservation of open space and biodiversity (see examples in Pearce and Moran (1994) and Fausold and Lilieholm (1999)), both of which are associated with species conservation. Likewise, a regional economy can benefit from the preservation of healthy populations of endangered and threatened species, and the habitat on which these species depend.

It is not feasible, however, to fully describe and accurately quantify these benefits in the specific context of the proposed critical habitat for the Plants, because: 1) no quantified data on the value of the Maui and Kaho‘olawe species exists; and 2) the Service is unable to provide specific data on the change in the quality of the ecosystem and the species as a result of the designation (for example, how many fewer ungulates will roam into the critical habitat, how many fewer invasive plants will be introduced as a result, and therefore how many more of the Plants will be present in the area). The discussion presented in the DEA and in this Addendum provides examples of potential benefits, which derive primarily from the listing of the species, based on information obtained in the course of developing the economic analysis. It is not intended to provide a complete analysis of the benefits that could result from section 7 of the Act in general, or of critical habitat designation in particular. In short, the Service believes that the benefits of critical habitat designation are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking.

7.bb. Comment (DLNR Land Exclusion)

The State Department of Land and Natural Resources, Land Division (DLNR-Land Division) requests that 15 tax map parcels be excluded from critical habitat because they: 1) are currently being leased for activities that could be adversely affected by the designation (e.g., agricultural leases); 2) have been identified as parcels with possible lease or development potential; 3) could suffer a significant loss in value; or 4) include water sources of water systems.

Response: As noted earlier, the Service indicates that it intends to modify the critical habitat designation, and as a result of the intended changes, five of the 15 parcels would no longer be within the intended designation. The ten parcels remaining in the intended designation are located in Units A, G1, G3, H, I1, I2, I3, I4, K, and L. These ten parcels overlap with the intended designation in the amount of approximately 7,015 acres. Approximately 90 percent (6,305 acres) is within the Conservation District. The other 10 percent (710 acres) is within the Agricultural District.

Chapter VI, Section 3.g. of the DEA and Section 4.e. of the Addendum discuss activities on Agricultural land and specifically recognizes that some of the State managed Agricultural land is leased out to private entities as pasturage. DLNR-Land Division specifically identified three parcels within the proposed critical habitat designation that are leased for pasture. Two of these parcels would no longer be within the intended designation. The third parcel, approximately 710 acres in the Agricultural District, would remain within the intended designation. No direct section 7 costs involving these leases are anticipated because there is no known *Federal involvement*.

Indirect costs, specifically the possibility of restrictions on the State's ability to lease the land due to the interplay between critical habitat designation and State law, are discussed in Section 5.b. of the Addendum. As noted in Section 5.b., the likelihood of a future lawsuit interfering with existing agricultural activity within the designated critical habitat is considered low, based upon review of the existing Federal and State law provisions and professional judgment. However, for illustration purposes, an estimate of the potential impact is \$7,100 per year utilizing the land rents of \$10 per acre per year (as used in the DEA) since DLNR did not provide any additional information regarding the value of the affected leases.

Of the remaining ten parcels, DLNR did not identify which have possible lease or development potential, could suffer a significant loss in value, or include water sources for water systems. As noted above, the portions of these parcels that overlap with the intended designation are all located within the Conservation District, where development is severely limited. Without more information from DLNR, it is difficult to evaluate how these parcels could suffer a significant loss in value as these parcels are already subject to the restrictions of the Conservation District. Finally, no costs are expected to occur from impacts to water systems, because none of the Plants are stream-dependent for their survival and therefore would not cause a reduction in water diversion. In addition, water infrastructure is considered a manmade feature and therefore its operation and maintenance are not subject to critical habitat provisions of section 7, because these features and structures normally do not contain, and are not likely to develop, any *primary constituent elements*.

Table Add-2. Revised Section 7 Costs and Benefits Attributable to the Plants Listing and Critical Habitat

(10-year estimates)

CH = critical habitat

PMs = project modifications

O&M = operation and maintenance

Fed = Federal

ne = not estimated

Item	DEA				Addendum		Explanation
	Total		Share to CH		Total		
	Low	High	Low	High	Low	High	
DIRECT SECTION 7 COSTS							
Management of Game Hunting							Past PMs not based on occupied or unoccupied status of area; future PMs anticipated to be similar to past PMs
State-Managed Lands, Consultations	\$ 4,100	\$ 12,700	\$ 1,200	\$ 5,800	\$ 4,100	\$ 12,700	
State-Managed Lands, PMs	\$ 115,500	\$ 185,000	\$ 92,400	\$ 148,000	\$ 23,100	\$ 37,000	
National Parks							
Haleakala National Park, Fencing Consultation	\$ 11,500	\$ 11,500	\$ 7,700	\$ 7,700	\$ 11,500	\$ 11,500	No changes
Haleakala National Park, Fencing PMs	Minor	Minor	Minor	Minor	Minor	Minor	
Haleakala National Park, Consultation for Trail Improvement	\$ 11,500	\$ 11,500	\$ 7,700	\$ 7,700	\$ 11,500	\$ 11,500	No changes
Haleakala National Park, Trail Improvement PMs	Minor	Minor	Minor	Minor	Minor	Minor	
State Parks and Trails							
Wai'anapanapa State Park, Consultation	\$ 19,400	\$ 19,400	\$ -	\$ -	\$ 19,400	\$ 19,400	No changes
Wai'anapanapa State Park, PMs	None	None	None	None	None	None	
Polipoli Spring State Recreational Area, Consultation	\$ 8,900	\$ 19,400	\$ 8,900	\$ 19,400	\$ 8,900	\$ 19,400	No changes
Polipoli Spring State Recreational Area, PMs	Minor	Minor	Minor	Minor	Minor	Minor	
Na Ala Hele Trail and Access System, Consultations	None	None	None	None	None	None	No changes
Department of Hawaiian Home Lands							
Kahikinui , Consultations	\$ 15,700	\$ 78,500	\$ 15,700	\$ 78,500	\$ -	\$ 47,100	Changes based upon intended reduction in area proposed for designation
Kahikinui PMs	None	None	None	None	None	None	No changes
Pu'u o Kali, Consultations	None	None	None	None	\$ -	\$ -	Changes based upon intended removal of area from designation
Kaho'olawe							
Kaho'olawe, Consultations	\$ 10,400	\$ 78,500	\$ 10,400	\$ 78,500	\$ -	\$ 47,100	No changes
Kaho'olawe, PMs	Minor	Minor	Minor	Minor	Minor	Minor	
Conservation Projects							
West Maui Mountains Watershed Partnership,	\$ 44,600	\$ 60,300	\$ 23,700	\$ 34,200	\$ 44,600	\$ 60,300	No changes
West Maui Mountains Watershed Partnership, PMs		None	None	None	None	None	
East Maui Watershed Partnership, Consultations	\$ 44,600	\$ 60,300	\$ 23,700	\$ 34,200	\$ 44,600	\$ 60,300	No changes
East Maui Watershed Partnership, PMs		None	None	None	None	None	
Kanaio Natural Area Reserve, Consultation	\$ 10,100	\$ 20,600	\$ -	\$ -	\$ 10,100	\$ 20,600	No changes
Kanaio Natural Area Reserve, PMs		None	None	None	None	None	
Other Conservation, Consultation	\$ 15,700	\$ 62,800	\$ 10,500	\$ 42,000	\$ 15,700	\$ 62,800	No changes
Other Conservation, PMs		None	None	None	None	None	

Table Add-2. Revised Section 7 Costs and Benefits Attributable to the Plants Listing and Critical Habitat

(10-year Estimates)

CH = critical habitat

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O&M = operation and maintenance

Fed = Federal

ne = not estimated

Item	DEA				Addendum		Explanation
	Total		Share to CH		Total		
	Low	High	Low	High	Low	High	
DIRECT SECTION 7 COSTS (continued)							
Agriculture and Ranching Operations							
Federally-sponsored operations, consultations	\$ 31,400	\$ 164,800	\$ 21,000	\$ 92,000	\$ -	\$ 41,200	Changes based upon intended reduction in area proposed for designation
EQIP or CRP funded projects, PMs	\$ -	\$ 400,000	\$ -	\$ 400,000	\$ -	\$ 100,000	
Electric Generation and Delivery							
Kaheawa Pastures 20 MW Windfarm, Consultation	\$ 19,600	\$ 19,600	\$ 19,600	\$ 19,600	\$ 19,600	\$ 19,600	No changes to costs, but Addendum reflects new information about activity
Kaheawa Pastures 20 MW Windfarm, PMs	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -	\$ 150,000	
Communications Facilities							
Hawaii Television Broadcasters Association Antennae,	\$ 27,100	\$ 40,300	\$ -	\$ 40,300	\$ -	\$ 40,300	No changes
Hawaii Television Broadcasters Association Antennae, PMs	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -	\$ 150,000	
New Facilities, Consultations	\$ 8,900	\$ 39,200	\$ -	\$ 39,200	\$ 8,900	\$ 39,200	No changes
New Facilities, PMs	\$ -	\$ 200,000	\$ -	\$ 200,000	\$ -	\$ 200,000	
Residential Development							
Potential Development within Agricultural District,	None	None	None	None	None	None	No changes
Water Systems							
Water improvement projects, Consultations	\$ -	\$ 68,000	\$ -	\$ 26,400	\$ -	\$ 68,000	No changes to costs, but Addendum reflects receipt of additional information
Water improvement projects, PMs	\$ -	\$ 200,000	\$ -	\$ 200,000	\$ -	\$ 200,000	
Military Activities							
Hawai'i Army National Guard, Consultations	\$ 15,700	\$ 15,700	\$ 10,500	\$ 10,500	\$ 15,700	\$ 15,700	No changes
Hawai'i Army National Guard, PMs	Minor	Minor	Minor	Minor	Minor	Minor	
U.S. Military, Consultations	None	None	None	None	None	None	No changes
Roads, Consultations	None	None	None	None	None	None	No changes
Ecotourism, Consultations	None	None	None	None	None	None	No changes
Natural Disasters							
Recovery Projects, Consultations	\$ 4,000	\$ 7,500	\$ 4,000	\$ 7,500	\$ 4,000	\$ 7,500	No changes
Recovery Projects, PMs	Minor	Minor	Minor	Minor	Minor	Minor	
TOTAL DIRECT COSTS							
Direct	\$ 418,700	\$ 2,075,600	\$ 257,000	\$ 1,791,500	\$ 241,700	\$ 1,441,200	Totals may understate economic impact because the cost of "minor" project modifications are not included
Discounted Present Value	\$ 294,077	\$ 1,457,815	\$ 180,506	\$ 1,258,275	\$ 169,760	\$ 1,012,239	Present value and annualized calculations are based on the OMB prescribed seven percent discount rate and the assumption that total costs are distributed evenly over the entire period of analysis.
Annualized	\$ 41,870	\$ 207,560	\$ 25,700	\$ 179,150	\$ 24,170	\$ 144,120	

Table Add-2. Revised Section 7 Costs and Benefits Attributable to the Plants Listing and Critical Habitat

(10-year Estimates)

CH = critical habitat PMs = project modifications O&M = operation and maintenance Fed = Federal ne = not estimated		
Item	DEA	Addendum Estimate and Explanation of Changes from DEA
INDIRECT COSTS		
Management of Game Mammals and Loss of Hunting Lands	Slight probability of a major impact	Same probability, impact slightly reduced based on intended unit modifications and updated survey data
Conservation Management	No obligation to proactively manage lands to control threats, but an undetermined probability of a major impact	Same obligation and probability, but impact reduced based on intended unit modifications
Subsistence and Native Hawaiian Traditional and Cultural Practices	Undetermined but slight probability of moderate impact	No change
Redistricting of Land by the State	Small probability of significant impacts	Same probability, but impact reduced based on intended unit modifications
State and County Development Approvals	Few anticipated projects, but costs to projects could range from insignificant to substantial	No change
Reduced Property Values	Decrease in property value expected to be small, but perceptions could contributed to more significant reduction	Overall potential decrease in value smaller due to intended unit modifications
Condemnation of Property	No condemnation resulting from CH. Also, the Service acquires land by negotiation not by condemnation	No change
Investigate Implications of CH	32 private landowners may investigate the implications of CH on their lands; costs could range from \$53,000 to \$304,000	Revised to reflect reduction in number of affected landowners based on intended unit modifications
Reduced Cooperation on Conservation Projects	Some landowners want to avoid CH designation	Based on landowner comments, significant reduction in cooperation in conservation projects
DIRECT SECTION 7 BENEFITS		
Regional Economic Activity Associated with Medical/Pharmaceutical Benefits	No way to determine statistical probability or economic value of future medicinal use or contribution of critical habitat	No change
Regional Economic Activity Generated by Conservation Management	Potential for increase, but may or may not reflect an increase in regional economy, depending on source of funding	Increase modified to reflect unit modifications
Regional Economic Activity Associated with Ecotourism	The Service prefers that guides do not feature visits to threatened & endangered plants.	No change
Regional Economic Activity Associated with Avoided Cost to Developers	Helps developers site projects.	No change
Social Welfare Benefits of Habitat Designation	The designation may result in the preservation of open lands	No change
INDIRECT BENEFITS		
Social Welfare Benefits of Endangered Species Preservation	Difficult to estimate preservation benefits and their value	No change
Social Welfare Benefits of Broader Ecological Improvements	Difficult to determine environmental improvements attributable to the implementation of section 7	No change

* Although the analysis does provide general estimates of some of the potential indirect costs shown below, not all of the estimates are summarized in this table. Because some of these indirect costs are highly speculative, this table instead reports qualitatively on their likelihood and magnitude. For additional information on any of these indirect impacts, the reader should refer to the economic cost and benefit chapter of the analysis. Only those costs deemed more likely to occur are included in this summary table in order to present the most probable overall impact of critical habitat designation.

REFERENCES⁴

- Bishop R.C. "Endangered Species: An Economics Perspective," *Transactions of the 45th North American Wildlife and Natural Resources Conference*. Wildlife Management Institute, Washington, D.C. 1980.
- Bishop R.C. "Endangered Species and Uncertainty: The Economics of a Safe Minimum Standard." *American Journal of Agricultural Economics* 60: 10-18. 1978.
- Boyle, K.J. and R.C. Bishop. "The Economic Valuation of Endangered Species in Wildlife." *Transactions of the Fifty First North American Wildlife and Natural Resources Conference*. Wildlife Management Institute. Washington, D.C. 1986.
- Brookshire, D.S., L.S. Eubanks, and A. Randall. "Estimating Option Prices and Existence Values for Wildlife Resources." *Land Economics* 56:1-15. 1983
- Eager, Harry. "Two Companies Vie for Single Permit to Build Wind-Power Farm." *Maui News*. November 20, 2002.
- Fausold, C.J. and R.L. Lilieholm. 1999. "The Economic Value of Open Space: A Review and Synthesis." *Environmental Management* 23(3): 307-320.
- Hageman, R.K. "Valuing Marine Mammal Populations: Benefit Valuation in a Multi-species Ecosystem." Administrative report No. LJ-85-22. National Marine Fisheries Service. Southwest Fisheries Center. La Jolla, California. 1985.
- Industrial Economics, Incorporated and Anden Consulting. "Draft Economic Impact Analysis of Proposed Critical Habitat for Threatened and Endangered Plants on Maui; Revised Determinations." U.S. Department of the Interior, Fish and Wildlife Service. September 2002.
- Juvik, J. O. and S. P. Juvik. *Atlas of Hawai'i*, third edition. Honolulu, Hawai'i. 1998.
- Memorandum to Chief, Branch of Listing, Washington, D.C. from Field Supervisor, Pacific Islands Field Office, Honolulu, Hawai'i re: Maui and Kaho'olawe Plants Critical Habitat Boundary Modifications and Addendum to the Draft Economic Analysis, December 12, 2002.
- State of Hawai'i, Department of Health. Clean Water Branch. Polluted Runoff Control Program. Accessible at <http://www.state.hi.us/doh/eh/cwb/index.htm#Polluted%20Runoff%20Control%20Program>
- State of Hawai'i, Kaho'olawe Island Reserve Commission. *Access and Risk Management Plan for the Kaho'olawe Island Reserve*. Wailuku, Hawai'i. May 2002.
- U.S. Department of the Interior, Fish and Wildlife Service. *Maui and Kaho'olawe Plant Critical Habitat*. Unpublished maps of intended final critical habitat. November 21, 2002.

⁴ Certain references listed in the references section of the DEA were also used in the preparation of the Addendum.

December 2002

U.S. Department of the Interior, Fish and Wildlife Service. Public Comment Received in Response to: *Endangered and Threatened Wildlife and Plants; Revised Determinations of Prudency and Proposed Designations of Critical Habitat for Plant Species From the Islands of Maui and Kahoolawe, Hawaii; Proposed Rule*. (Federal Register, April 3, 2002) and *Draft Economic Impact Analysis of Proposed Critical Habitat for Threatened and Endangered Plants on Maui; Revised Determinations*. (September 2002).

U.S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, U.S. Census Bureau. 2001 National Survey of Fishing, Hunting and Wildlife-Associated Recreation. October, 2002.

U.S. Environmental Protection Agency. *Guidelines for Preparing Economic Analyses*. EPA 240-R-00-003. September 2000.

Information was provided in communications with representatives of:

— U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office